DOCUMENT RESUME

ED 117 229 95 UD 015 622

AUTHOR	Coulson, John E.; And Others
TITLE	The First Year of Emergency School Aid Act (ESAA) Implementation. Preliminary Analysis.
INSTITUTION	System Development Corp., Santa Monica, Calif.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
REPORT NO	SDC-TM-5236-008-00
PUB DATE	15 Sep 75
CONTRACT	OEC-0-73-0831; OEC-0-73-6336
NOTE	225p.
EDRS PRICE	MF-$0.76 HC-$10.78 Plus Postage
DESCRIPTORS	Bias; Discriminatory Attitudes (Social); Economically Disadvantaged; Educationally Disadvantaged; Elementary Grades; Family Characteristics; *Minority Group Children; Minority Groups; *Program Evaluation; *Racial Segregation; Resource Allocations; Secondary Grades; *Social Discrimination; Socially Disadvantaged; Student Characteristics
IDENTIFIERS	*Emergency School Aid Act

ABSTRACT

This report summarizes the national implementation and impact of the Emergency School Aid Act (ESAA) Basic and Pilot Programs during the 1973-74 school year-the first year of their operation in school districts across the nation. Sections deal with evaluation sample selection; district, community, and school characteristics; student and family characteristics; resource allocations; funds and services; basic program desegregation; student gains in achievement test scores; exploratory analyses; and summary of results. Two important facts are stressed: (1) that this report deals only with the first year of implementation, and (2) that because of difficulties in obtaining outcome data that might more directly reflect desegregation activities in the first year of the study, the present report is based on a single set of criterion measures - achievement test scores in reading and mathematics. Findings indicate that: (1)the assumption on which the legislation was based is, indeed, associated with educational disadvantages; and (2)that students in minority-isolated schools and many students in desegregated schools have needs associated with their educational and economic disadvantagement that are directly related to the objectives of the program. (Author/AM)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

UD015622

ED117229

THE FIRST YEAR OF
EMERGENCY SCHOOL AID ACT (ESAA) IMPLEMENTATION

John E. Coulson
Dan G. Ozenne
Nancy C. Van Gelder
Dianne Inuzuka
Clarence Bradford
William J. Doherty

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

September 15, 1975

Emergency School Aid Act National Evaluation
United States Office of Education Contract Numbers
OEC-0-73-0831 and OEC-0-73-6336

System Development Corporation

TM 5236/008/00

UD 015 622

PROJECT OFFICER, PROJECT PERSONNEL, AND SUBCONTRACTORS

Project Director

John E. Coulson, Project Director
Dee Dingler, Secretary

Planning and Control

Thomas F. Collins, Administrator
Marilyn Stevenson
Kathy Kibbey, Secretary

Operations

Raymond B. Stewart, Manager
Jean B. Wellisch, Special Studies Coordinator
Dean R. Lee, Data Collection Coordinator
Patricia A. Acosta
Emily H. Allison
Gary A. Duck
James L. Hoyt
Al Marcus
Janet Chryssanthis, Secretary
Jan Hatch, Secretary

Analysis

Dan G. Ozenne, Manager
Raymond W. Baker
Marilyn Crilley
William J. Doherty
Judith Hemenway
Eric Nelson-Lund
Nancy Van Gelder
Clarence Bradford, Analysis Advisor
Connie Dolphus, Secretary

Washington Liaison

Patrice Metro

Editorial

Kean Mantius
Una Vere Katter

Project Officer

Michael J. Wargo, Project Officer
U.S. Office of Education

Consultants and Resource Persons

Earl Houseman
Ward Keesling
Anne MacQueen
Harold Nichols
Melvin Novick
Leo Reeder
David Wiley

Subcontractors

American College Testing Program
Center for the Study of Evaluation

Former SDC Project Members

Lillian Barros
Alice Bloch
Alan Cohen
Paula Gerber
Mildred Henderson
Dianne Inuzuka
William Kent
Beverly Kooi

ACKNOWLEDGMENTS

The authors wish to give special thanks to Dr. Michael Wargo, U.S. Office of Education, for his valuable suggestions regarding the technical conduct of the study and for his insights concerning the major policy issues to be addressed in the report. Also gratefully acknowledged are the recommendations of the members of the ESAA Evaluation National Advisory Panel, whose names and affiliations are given in Appendix B of this report: these panel members played an active role in the study, making major substantive contributions as well as helping to provide broad perspective in interpretations of the study's findings.

The Equal Educational Opportunity (EEO) Program administration and staff, expecially Dr. George Rhodes, were extremely helpful in providing access to program records and in commenting on evaluation plans and products. We would also like to express appreciation to the Office of Civil Rights for providing data on minority-group isolation in the sample districts. Finally, we wish to acknowledge the cooperation of administrators and staff in the sample districts and schools, without whose participation this study would not have been possible.

The views reflected in this document are not necessarily the views of the U.S. Office of Education.

TABLE OF CONTENTS

Page

Executive Summary xi

I. Introduction I-1

II. Evaluation Sample Selection II-1

III. District, Community, and School Characteristics III-1

IV. Student and Family Characteristics IV-1

V. Resource Allocations: Funds V-1

VI. Resource Allocations: Services VI-1

VII. Basic Program Desegregation VII-1

VIII. Student Gains in Achievement Test Scores VIII-1

IX. Exploratory Analyses IX-1

X. Summary of Results X-1

Appendix A. Additional Tables Based on 1973-1974 Data A-1

Appendix B. ESAA National Evaluation Advisory Panel's Statement of Involvement B-1

Appendix C. Statement of ESAA National Evaluation Advisory Panel . C-1

Appendix D. Position Statement by Dr. George D. Jackson D-1

LIST OF TABLES

Page

Table III-1 Geographic Distribution of Award and Sample ESAA Districts III-2

Table III-2 State Distribution of Awards in Pilot Universe and Sample III-3

Table III-3 State Distribution of Awards in Basic Universe and Sample III-5

Table III-4 Regional Distribution of Sample Schools III-6

Table III-5 Treatment-Control School Distribution for Sample Schools in Year I (1973-1974) by Program Type III-10

Table III-6 Racial/Ethnic Composition of Students in Sample Districts, by Region III-11

Table III-7 Student Racial/Ethnic Group Composition in Sample Schools III-12

Table III-8 Percentage of Minority Students Represented In Sample Schools in the Three Evaluation Groups III-13

Table III-9 Staff Racial/Ethnic Composition in Sample Schools III-14

Table III-10 Percentages of Minority Students and Staff in Sample Groups III-15

Table III-11 Community-Size Context of Sample Programs III-17

Table III-12 District Average Daily Attendance (ADA) and Total School Enrollment III-18

Table III-13 SES Distribution of Students in Sample Districts, As Indicated by Percentage of Students Eligible for ESEA Title I Funds III-20

Table III-14 Percentages of Students Estimated to be "Disadvantaged" Under ESEA Title I in Sample Groups III-21

LIST OF TABLES (continued)

Page

Table IV-1 Availability of Educational Materials in the Home (SES/Reading) for Basic Elementary, Basic Secondary, and Pilot Students IV-3

Table IV-2 Availability of Luxury and Convenience Items in the Home (SES/Luxury Possessions) for Basic Elementary, Basic Secondary, and Pilot Students IV-4

Table IV-3 Racial/Ethnic Composition by Grade Level of the Pilot, Basic Elementary, and Basic Secondary Samples IV-5

Table IV-4 Pretest Achievement Levels for Pilot and Basic Elementary Students IV-7

Table IV-5 Pretest Achievement Levels for Basic Secondary Students IV-10

Table IV-6 Total Reading and Total Math Pretest Scores by Racial/Ethnic Group and Grade Level IV-11

Table V-1 Standardized Total and Supplemental Per-Pupil Expenditures for Sample Districts, 1973-74. . . . V-5

Table V-2 Regional Variation in Standardized Total and Regular Per-Pupil Expenditure, 1973-74 . . . . . V-7

Table V-3 Standardized Total Per-Pupil Expenditures (All Sample Schools), 1973-74 . . . . V-8

Table V-4 Standardized Total Per-Pupil Supplemental Expenditures (All Sample Schools), 1973-74. . . . V-8

Table V-5 Standardized ESAA Per-Pupil Expenditures (All Treatment Schools), 1973-74 . . . . V-9

Table V-6 Percentages of ESAA and Non-ESAA Supplemental Funds Spent on Reading, Math, and "Other" Activities in Treatment Schools V-11

Table V-7 Standardized Total Per-Pupil Expenditures for Schools in Treatment-Control Pairs, 1973-1974 . . V-13

LIST OF TABLES (continued)

		Page
Table V-8	Standardized Per-Pupil Total Supplemental Expenditures for Schools in Treatment-Control Pairs, 1973-1974	V-15
Table V-9	Frequency Distribution of Percentage Differences in Total Supplemental Funding for Treatment-Control Pairs	V-16
Table V-10	Percentages of Total Supplemental Money Spent on Reading, Math, and "Other" Activities	V-18
Table VI-1	Specialized Support Staff Composition in Sample Schools	VI-5
Table VI-2	Correlations Between Academic Needs and Services Received in Basic Elementary Programs	VI-17
Table VI-3	Correlations Between Academic Needs and Services Received in Pilot Programs	VI-18
Table VI-4	Correlations Between Academic Needs and Services Received in Basic Secondary Programs	VI-18
Table VII-1	Number of Years District Had Been Desegregating in Relation to Percentage of Minority Students in Districts in Fall 1973	VII-4
Table VII-2	Range of the 1973-1974 District Desegregation Index Values for the Sample Basic Districts . . .	VII-5
Table VII-3	Relationship Between 1973-1974 District D.I. Value and District's Percentage of Minority Students in Fall 1973	VII-6
Table VII-4	Percentage of Non-Minority and Minority Elementary Students in the ESAA Basic Evaluation Districts Who Attended, for Desegregation Purposes, a School That Was Not the School Nearest to Their Home	VII-8
Table VII-5	Percentage of Non-Minority and Minority Secondary Students in the ESAA Basic Evaluation Districts Who Attended, for Desegregation Purposes, a School That Was Not the School Nearest to Their Home	VII-9

LIST OF TABLES (continued)

Page

Table VII-6 Relationship Between District D.I. Gains and HEW Region, Number of Years Desegregating, Compliance Code, and Percentage of Minority Students in District in Fall 1973 . . . . VII-12

Table VII-7 Relationship Between District D.I. Gain in Fall 1973 and Total District Enrollment Size . . . VII-13

Table VIII-1 Final Set of Covariates by Evaluation Sample . . . VIII-3

Table VIII-2 Student Performance Levels (Treatment and Control) and Grade Equivalents VIII-9

Table VIII-3 Percentages of Schools Meeting or Exceeding Achievement Gain Criteria at a Given Probability VIII-15

Table IX-1 Canonical Correlations: School Actions with Teacher Attitudes IX-10

Table IX-2 Canonical Correlations of School Action and Staff Attitudes with Classroom Integration IX-12

Table IX-3 Canonical Correlations of School Action, Staff Attitudes, and Classroom Integration with Student Attitude Toward School IX-14

EXECUTIVE SUMMARY

This report summarizes the national implementation and impact of the Emergency School Aid Act (ESAA) Basic and Pilot Programs during the 1973-74 school year --the first year of their operation in school districts across the nation. The ESAA Basic and Pilot programs are both elementary and secondary school programs designed to deal with problems associated with minority-group isolation. The Basic program is a desegregation program that provides funds to local school districts (a) to encourage their elimination of minority-group isolation, (b) to help them meet special needs incident to the elimination of segregation and discrimination; and (c) to help them overcome educational disadvantages associated with minority-group isolation. In contrast to the Basic program, the ESAA Pilot program is essentially a compensatory education program for students enrolled in minority-isolated schools (i.e., schools with 50% or greater minority enrollment).

The national evaluation of the Basic and Pilot programs was designed to determine the cumulative impact of ESAA programs in terms of the Act's objectives over a period of three school years. The evaluation design anticipated the fact that the first year of implementation of any national educational program is always a formative one, requiring adaptation of schools, school staffs, and students to new projects. Consequently, this report, which focuses on year one of ESAA, should be considered a progress report on that process of implementation and adaptation rather than a definitive report on the success of the Act in achieving its objectives. Later ESAA evaluation reports should provide the measure for assessing the Act's effectiveness.

Although preliminary in nature and premature for assessment of ultimate program effectiveness, the first-year ESAA evaluation results are encouraging. First, the findings indicate that the assumption upon which the legislation was based is a matter of fact--minority-group isolation in our nation's schools is indeed associated with educational disadvantages. Students in minority-isolated schools, regardless of their racial or ethnic status, are achieving significantly below the national norm in reading and mathematics. Further, students in minority-isolated schools, or recently from such schools, tend to be more educationally, socially, and economically disadvantaged than their peers in non-isolated schools.

A second finding, related to the first, is that students in minority-isolated schools and many students in desegregated schools have needs associated with their educational and economic disadvantagement that are directly related to the objectives of ESAA. Even more relevant for a preliminary assessment of program implementation, first-year evaluation results seem to indicate that ESAA resources in terms of both dollars and services have, on the whole, been properly targeted at those documented needs. There is also some evidence that the resource allocation process began to have positive impact on the academic achievement of students in ESAA-funded districts over the short five-and-one-half-month period evaluated. In short, although preliminary, the findings of the first year of evaluation suggest that the ESAA program is based upon sound assumptions and may ultimately achieve one or more of its objectives.

In addition to the above national impact findings, the first year-results suggest that relationships among student, staff, and program characteristics and student outcomes differ somewhat for minority-isolated as compared to desegregated schools. In minority-isolated schools, preliminary findings indicate that there is a positive relationship between the level of supplemental reading program funding and student reading and mathematics achievement. Similarly, lower pupil/teacher ratios seem to be positively related to student mathematics achievement in minority-isolated schools. For reasons that are not clear, no such relationships were found in desegregated schools. Nevertheless, in desegregated schools, positive desegregation-related policies, attitudes, and activities of district and school staff appear related to positive student expectations, student liking for school, and student reading and mathematics achievement. Also in desegregated schools, at least at the secondary level, the results suggest a positive relationship between reading achievement and the amount of time spent in reading instruction. Findings such as the above, if validated by second- and third-year results, should provide guidance for legislative and/or regulatory changes designed to increase program effectiveness.

As the reader will find upon reviewing this report, the above findings are not definitive and should not be construed as final conclusions regarding the Act's effectiveness--the data for such an assessment will be summarized in the evaluation reports for years two and three. Nevertheless, the preliminary findings are encouraging, and will form an analytic foundation upon which the primary impact assessment of later reports can be properly grounded.

Michael J. Wargo, Ph.D.
U.S. Office of Education
ESAA Evaluation Program Officer

CHAPTER I

INTRODUCTION

Under contracts from the U.S. Office of Education, System Development Corporation (SDC) is conducting an evaluation of two closely related programs authorized by the Emergency School Aid Act (ESAA). The Pilot program was created to support "unusually promising ESAA pilot programs or projects designed to overcome the adverse effects of minority group isolation by improving the academic achievement of children." Eligible districts must have 15,000 minority students enrolled, or minority students must constitute more than 50% of the total enrollment. The Basic Grants program consists of grants to local education agencies for the purpose of implementing plans to (a) completely eliminate minority isolation in all schools within the agency, (b) eliminate or reduce minority isolation in one or more schools within the agency, (c) reduce the total number of minority-group children who are in isolated schools, or (d) prevent minority isolation that is reasonably likely to occur without assistance under the Act. Basic Grant applicants have been encouraged to focus their programs on improving basic educational skills.

The combined Basic/Pilot evaluation involves collection of data over a period of three school years, 1973-74, 1974-75, and 1975-76. This report describes the evaluation results for the first year (1973-74). Subsequent reports will present results for 1974-74 and 1975-76, as well as cumulative trends over the two- and three-year periods.

For reasons described in the report, the only criterion measures of program success available for the 1973-74 evaluation were students' scores on standardized achievement tests in reading and mathematics. In the next two evaluation years, increased emphasis will be placed on desegregation-related activities and outcome measures. Specifically, test scores will be supplemented by criterion measures of reduction in minority-group isolation and by indicators of desegregation-related school climate.

It is anticipated that the report may have several different audiences, each with its own particular interests and knowledge. These potential audiences include Congress and the Office of Education, civil rights and other advocate groups, district-level program administrators, educational researchers, and evaluation specialists. Because the primary goal of the evaluation is to inform decision-makers, rather than to add to the literature on evaluation/research methodology, the major focus throughout the report is on results, not techniques. Excessive procedural details have been avoided, and, where possible, major findings have been highlighted. Most of the data tables have been relegated to the appendix and are referred to in the appropriate pages of the text.

The remainder of this chapter provides a brief overview of the operational ESAA programs and of the evaluation objectives and methodology, and discusses certain limitations of the present report. Chapter II describes the rationale and methodology of the evaluation sampling procedures and presents data concerning the representativeness of the resulting samples. Chapters III through VI describe the school programs and funding allocations, the community/district context within which the sample programs operated, and the sample students enrolled in those programs. Chapter VII focuses specifically on the desegregation plans and activities of the sample Basic districts and examines evidence concerning the amount of district desegregation possibly associated with ESAA program implementation. Chapters VIII and IX discuss achievement-test gains made by sample students during the 1973-74 school year and attempt to relate those gains to the experimental variable (ESAA funding) and to other student and program dimensions. Finally, Chapter X presents an overall summary of the major findings and conclusions for the first evaluation year.

A. OVERVIEW OF ESAA PROGRAM LEGISLATION AND FUNDING

The Emergency School Aid Act (ESAA) was enacted into law in June of 1972 to provide elementary and secondary school districts with financial assistance to (1) meet the special needs incident to the elimination of minority-group segregation and discrimination; (2) encourage the voluntary reduction, elimination, or prevention of minority-group isolation; and (3) aid children in overcoming the educational disadvantages of minority-group isolation [P.L. 92-318, Sec. 702 (b)]. While the Act as amended in 1974 (P.L. 93-380, Sec. 641) authorizes the appropriation of $1 billion for fiscal year 1973 and a similar amount for the period ending June 30, 1976, actual appropriations have amounted to $270 million, $234 million, and $215 million for fiscal years 1973, 1974, and 1975, respectively. Since funds are annually appropriated for obligation and expenditure during the fiscal year succeeding the year of appropriation, the major thrust of the Act began during school year 1973-74 and is expected to continue through school year 1976-77.

Seventy-four percent of the Act's annual appropriation is reserved for two subprograms, the Basic Grants program (59%) and the Pilot program (15%). The Basic Grants program is essentially a desegregation program designed to reduce minority-group isolation, to meet the needs incident to the elimination of segregation and discrimination, and to aid school children in overcoming the educational disadvantages of minority-group isolation. In contrast, the Pilot program is a compensatory education program designed to improve the academic achievement of children in minority-isolated schools (i.e., schools with over 50% minority enrollment).

The sums annually appropriated pursuant to the Act are apportioned to states on the basis of the ratio of their number of minority-group school-aged children to the number of such children in all states. Local school districts compete for the funds apportioned to their state through grant applications to their HEW Regional Office. In applying for an ESAA grant, a local school district must demonstrate that it has needs related to the Act's objectives and that it has designed a program based on authorized activities that show promise of achieving one or more of the Act's objectives.

B. DESCRIPTION OF ESAA EVALUATION

The Act authorizes a national evaluation of its programs which may be supported by up to an annual 1% reservation of appropriated ESAA funds. As designed by the U.S. Office of Education (USOE) and conducted by System Development Corporation (SDC), the national evaluation focuses on the integrated evaluation of the ESAA Basic and Pilot programs. The remainder of this section summarizes the major evaluation objectives for both programs and describes the general methodology being applied to meet those objectives.

1. EVALUATION OBJECTIVES

The overall evaluation has several major objectives, some of which involve longitudinal analyses and comparisons of data collected over two or three years. Certain other objectives involve data collected in special studies not conducted until the second evaluation year. A summarized list of all the key study objectives is presented below; each objective is accompanied by a brief note concerning the extent to which that objective is addressed in the present first-year report.

- Determination of the short- and long-term national impact of the program in terms of the Congressionally authorized program objectives, namely, reduction in minority-group isolation, elimination of discrimination, and improvement of basic skills in elementary and secondary schools. The present report is based on a single year's impact data, and therefore is strictly cross-sectional in nature. Furthermore, the only type of outcome (criterion) measure used for gauging program impact in the first year was students' performance on standardized achievement tests. Longitudinal trends and outcome data based on measures of minority-group isolation and perceived school discrimination will be discussed in the Year Two and Year Three Reports.

- Identification and description of the needs of students in or from minority-isolated schools; the characteristics of local programs, including the relationships between student needs and resource allocations in the sample districts; and the interrelationships of student needs, program characteristics, and program impact. This objective is directly addressed in the present report.

- Documentation and dissemination of information relating to unusually successful local programs and program components that appear to be related to success. In-depth data on successful sites were not collected until the second evaluation year and are not included in this report.

- Determination of the relative effectiveness of three forms of educational intervention--desegregation, compensatory education, and a combination of these--as compared to minority-isolated schools with no special intervention. These comparisons have been deferred until the second-year report to allow a longer period for the different program approaches to show differential impacts.

- Investigation of the relationships among regular school expenditures, supplemental ESAA expenditures, and program impact, in an attempt to determine local program cost-effectiveness and the minimum supplemental expenditures necessary to ensure some measure of program success. The present report examines relationships between per-pupil funding levels (regular and supplemental) and program impact, but the determination of minimum necessary supplemental expenditures ("critical mass") is deferred to the second-year report to allow the inclusion of more detailed information on resource allocations in successful sites.

2. GENERAL METHODOLOGY

The combined Basic/Pilot evaluation involves collection of data over a period of three years, beginning with the 1973-74 school year addressed in this report. This multi-year design allows analyses of cumulative program impact and of possible fadeout of program impact after students are transferred out of the ESAA activities. In addition, it provides an opportunity to assess program maturation effects (e.g., greater program impact on each successive wave of new students in the second and third years of operation).

For both Pilot and Basic programs, standardized achievement tests are administered at the beginning and end of each school year to assess gains made in reading and math by a sample of students participating in the ESAA projects. The same tests are given to a sample of students in control (non-ESAA) schools, which are drawn at random from the same districts as the treatment (ESAA-funded) sample schools and selected to match as closely as possible the characteristics of their paired treatment schools. This emphasis on matched schools within districts makes it possible to hold important district factors common in paired comparisons of treatment and control schools and to achieve a true experimental design by random assignment of each pair of schools to the treatment and control conditions.

Because of interest in evaluating ESAA programs at both the elementary and secondary levels, schools at both levels are included in the Basic Grant program sample. Too few Pilot awards were given at the secondary level to include high schools in the Pilot sample. Grade levels included in the evaluation are grades 3, 4, and 5 (elementary) and 10, 11, and 12 (secondary). The use of three successive grades at each school level allows longitudinal following of individual sample students for up to three years, depending on their grade placement at the start of the evaluation. To be eligible for inclusion in the study, schools must have sufficiently large numbers of ESAA participants (or ESAA-eligible students, in the case of control schools) to allow for attrition over the evaluation period; toward this end, larger samples were initially drawn at grades 3 and 10 than at other grades to allow for following those samples for three years.

Two other major outcome measures planned for the multi-year evaluation consist of data on perceived discrimination (school climate) and on reduction of minority-group isolation. It was not possible to obtain adequate data on these variables for use as criterion measures in the present report, but they will be included in reports for the second and third years.

In addition to the outcome measures, questionnaires and other recording forms are used once each year to obtain extensive data on the school programs themselves (in both treatment and control schools) and on sample students. Near the end of each school year, a battery of questionnaires is administered to superintendents, district business managers, local ESAA coordinators, principals, teachers, and students in the sample. Those questionnaires provide data on district, school, and classroom minority-group isolation, program operation, resource allocation, and student and staff background characteristics.

Finally, student activity logs are used to record the amount of time that a student is exposed to different types of educational experiences (e.g., peer tutoring in math, cultural enrichment programs, etc.). The logs provide a cumulative record of each student's interactions with the educational system, with emphasis on compensatory activities of the sort presumably stressed by ESAA projects.

Data analyses, designed to focus on the major evaluation goals described above, include determinations of pretest-posttest changes in outcome measures, to assess overall gains across both treatment and control schools; comparisons of pretest-posttest gains between treatment and control schools in the matched pairs, to evaluate the impact of the experimental variable (ESAA funding); comparisons of outcomes associated with different intervention approaches; ranking of local programs with respect to impact, to identify particularly successful projects; and analyses of relationships among program features, student characteristics, and program impact. In connection with the second-year evaluation, school expenditure data will be analyzed in relation to impact data to determine the minimum supplemental expenditures necessary to ensure program success and to identify local project components that differentiate successful from unsuccessful projects.

C. REPORT LIMITATIONS

Readers of this report should be aware of several important limitations stemming from the short period of ESAA program operation covered by the report and from constraints in the types of data available during the initial evaluation year.

Some of the local programs included in the first-year evaluation were not in full operation until at least two or three months into the school year, with the result that districts often could not identify ESAA-participating students until late October or November 1973. This, in turn, led to a pretest schedule that stretched into November or, in a few cases, into December. As a consequence, the average pretest-posttest interval was only slightly more than five months. Such a brief period of time can hardly be considered a true test of the effectiveness of the ESAA program, or of any other innovative educational program seeking to effect broad improvements in schools with minority-isolated and disadvantaged students.

A second limitation in the first-year evaluation and in this report is the fact that only one type of outcome measure--achievement test performance--could be used in the analyses of program impact. This constraint is clearly an important one, considering that key objectives of the ESAA Basic program also include reduction of minority-group isolation and in-school discrimination. An attempt was made in the first year to collect pretest and posttest data on racial attitudes by means of a questionnaire designed for administration to students at the beginning and end of the school year. The questionnaire was given at the start of the year, but strong opposition to the instrument was raised by several districts, resulting in a federal government decision not to release the questionnaire for end-of-year administration. Thus, it was impossible to assess race-related attitudinal changes that might have occurred during the school year. Subsequently, a new instrument has been developed by a special advisory panel to the ESAA evaluation project, consisting of members of various minority-group and other interested organizations. This instrument, which focuses on students' perceptions of systematic school discrimination, was administered at the beginning and end of the second evaluation year. It will provide the basis for including a second type of outcome measure (school climate) for assessing program impact in later evaluation reports.

With respect to the third intended category of outcomes, reduction in minority-group isolation, Office of Civil Rights (OCR) data pertiment to this outcome dimension were analyzed, and descriptive summaries are provided in Chapter VII of this report. However, because of certain internal inconsistencies in some of the data, and because the indices used by OCR as measures of desegregation are somewhat insensitive to the types of changes that might be expected in this study, it was decided not to use these data in analyses of Basic program impact for the first evaluation year. Efforts are currently under way to develop improved measures for use in subsequent reports.

One further limitation of the report is that it represents only a cross-sectional view of a single year of program operation. Some of the major evaluation objectives deal with multi-year, longitudinal effects of the ESAA programs. Analyses pertaining to these important effects will be included in later reports on the second and third evaluation years.

CHAPTER II

EVALUATION SAMPLE SELECTION

Implicit in the ESAA evaluation objectives (see Chapter I) were several important requirements for the sample design. The most critical of these requirements were as follows:

- Evaluation data were needed at both the elementary and secondary levels, as there was strong interest in ESAA program operations and impact at both levels.

- The longitudinal nature of the study required data collection at multiple grade levels, so that cohorts of students starting ESAA participation at different times and grades could be followed for more than one year. To meet this requirement, three consecutive grade levels were selected at the elementary level (grades 3 through 5) and three at the secondary level (grades 10 through 12).

- Sufficiently large samples of students were needed at each grade level in each sample school to allow for anticipated attrition over a period of up to three years.

- The sample universe was limited where possible to districts having two or more schools designated for ESAA participation. By this means, matched pairs of treatment and control schools could be sought with total intra-district equating of district-level variables.

A. DEVELOPMENT OF SAMPLE UNIVERSE DEFINITION

The initial sample universe was derived from districts receiving ESAA awards for school year 1973-1974 in April or June 1973. This universe was further limited to districts having Basic and/or Pilot programs planned for grades 3, 4, and 5, or for grades 10, 11, and 12.

At this point, a preliminary review was conducted of district grant applications to determine how many districts were likely to meet the sample universe requirements as initially defined. Data available in most applications included the names of ESAA-participating* schools, participating grade levels, numbers of participating students, percentages and types of participating minority students, and types of ESAA activities planned.

Based in part on data in the district grant applications, and in part on design requirements discussed above, a preliminary sampling plan was adopted, subject to final revision as further data became available on the ESAA programs. Major features of the plan were as follows:

- Three independent universes would be defined and sampled: a Pilot elementary universe, a Basic elementary universe, and a Basic secondary universe. No Pilot secondary schools would be considered, since the number of Pilot awards involving secondary schools was small.
- The Pilot and Basic elementary samples would include students at grades 3, 4, and 5, while the Basic secondary sample would include grades 10, 11, and 12.
- No sample would be sought from "overlap" districts receiving both Basic and Pilot grant awards. Although it was initially planned to give special attention to this "overlap" universe, the number of such districts was found insufficient for analytic purposes; given this constraint, it was felt that the inclusion of some districts with one type of program and some with both types would unnecessarily confound the evaluation design.
- For each of the three universes, a sample of at least 25 pairs of participating schools would be sought. Schools would be paired by similarity in minority-group enrollment, in pre-ESAA achievement level, and in socioeconomic status. Within pairs, treatment and control conditions would be randomly assigned; this would result in ESAA funds being withheld from one school of each selected "participating" pair of schools.
- Students would be sampled across classes, rather than by intact classes, to increase the number of classes and teachers represented within the sampling constraints.

---

[*] For purposes of this sampling discussion, references to schools' or students' "participating" in ESAA activities simply means that they were so designated in the districts' grant applications. In reality, none of the schools or students were actively engaged in ESAA activities at the time of sample selection; furthermore, some of them were ultimately assigned to the control (non-ESAA-funded) condition, and therefore never participated in ESAA programs.

To implement the sampling plan and to further define the desired universes, additional information was obtained by telephone from the school districts. Prior to telephone contact, a screening procedure was initiated to reduce the number of calls. Pilot applications were screened to eliminate all districts not having planned ESAA activities in grade 3, 4, or 5, and Basic applications were reviewed to exclude all districts not having planned ESAA activities in any of the grade levels of interest. A further reduction of the Basic elementary group was accomplished by removing a 50% random sample from the set of districts having comparatively small numbers of participating schools, or having ESAA activities in only one or two of the grade levels of interest. This reduced the total number of required calls to 259 districts. In these calls, each district was asked for information on the name of each school designated to participate in ESAA, the participating grade levels within each school, the type and percentage of each minority group in the school's enrollment, comparative ratings within the district of each school's academic achievement, and comparative ratings within the district of the school's socioeconomic status.

The rating of socioeconomic status was a comparative estimate by the district of the status of the families served by each school. This estimate was based on such factors as the school's participation in Federal school lunch programs. The index of academic achievement was based in most cases on school records of standardized achievement test scores.

B. EVALUATION UNIVERSES AND SAMPLES, REDEFINED TO REFLECT PROGRAM DATA

After redefinition to reflect data obtained on the planned programs in ESAA districts, the evaluation universes and samples were as follows:

1. PILOT ELEMENTARY SAMPLE

Because of constraints in the number of funded Pilot programs, it was necessary to select a primary Pilot evaluation universe and a supplemental evaluation universe. The primary evaluation universe consisted of all districts with Pilot programs awarded in April or June 1973, having two or more participating schools with Pilot activities in at least two consecutive grade levels of interest. Additional requirements of this universe were (1) that the participating schools should be pairable (i.e., similar in student socioeconomic status, pre-ESAA achievement, and percentage and type of minority enrollment), and (2) that each participating school should have at least 25 participating students in each of grades 3, 4, and 5.

Only 17 Pilot districts could be identified that met the requirements of the primary evaluation universe. All of these districts were included in the final sample, as it was originally desired to have at least 25 districts with pairable schools. Therefore, at the district level, the sample was identical to the primary evaluation universe. Each of these districts became a stratum, with the primary sampling unit being the school. One school was randomly selected with equal probability within each district. The school that was the "best possible" match was then selected by employing the above criteria. One school in this pair was randomly assigned to the treatment condition and the other automatically became the control school for that district.

Because of the small number of resulting pairs, it was felt necessary to select additional Pilot schools that could not be paired. (These ESAA-participating schools were to be used to round out the sample for descriptive purposes, but could not be used, of course, in the experimental analysis of treatment-control differences in achievement test scores.) Thus a second, or supplemental evaluation universe was defined to augment the Pilot sample. This supplemental universe initially consisted of Pilot districts having unpairable schools with Pilot programs in at least two consecutive grades of interest. Each district containing one or more acceptable schools was designated as a stratum. One school was randomly selected with equal probability within each stratum and designated as a treatment school. This resulted in 18 additional treatment schools being added to the sample.

To further increase the Pilot sample, there was a second round of sampling from districts in the supplemental universe. A district was resampled if it had either or both of the following conditions: (1) one or more previously unpairable schools; (2) one or more previously unselected pairs of schools. Each district from this group was designed as a stratum, and one school was randomly selected from each stratum. This process resulted in 10 additional treatment schools.

In districts in which the grades of interest were not housed in the same school (for example, where grade 3 was in a primary school and grades 4 and 5 were in a middle school), the two schools were treated as a single school unit in the sample.

A total of 35 districts were represented in the final Pilot sample. This included 17 districts with matched pairs of treatment and control schools (i.e., districts in the primary evaluation universe), and 28 districts with a single treatment school. (Ten of the districts had both a treatment-control pair and a single treatment school.) Of the total 62 schools, therefore, 45 were in the treatment condition.

2. BASIC ELEMENTARY SAMPLE

The Basic elementary evaluation universe consisted of districts receiving Basic elementary grants in April or June 1973, having two or more pairable schools with Pilot program activities designated for grades 3, 4, and 5. An additional requirement was that each participating school should have designated at least 50 participating students in each of those grades.

Because it was evident that there would be more than an adequate number of districts meeting these criteria, a further reduction was made in the universe of eligible districts by eliminating a 50% random sample from the set of districts having comparatively small numbers of participating schools or having only one or two of the grade levels of interest. The resulting universe was found to include

47 Basic elementary districts, all of which were selected for the evaluation sample.* Thus, while the final district sample did not contain the entire evaluation universe, it did include all of the districts most fully meeting all of the selection criteria.

Each district was defined as a stratum, and one school was randomly sampled from each stratum; the "best" matching school was then selected as the other member of the pair. One school of each pair was randomly assigned to the treatment condition, and the other school to the control condition. No further sampling was performed on the Basic elementary evaluation universe, as the total of 47 districts and 94 schools (47 pairs) fulfilled the initial design specifications of at least 25 pairs of schools.

3. BASIC SECONDARY SAMPLE

The Basic secondary evaluation universe consisted of all districts receiving Basic secondary grants in April or June 1973, having two or more pairable schools with Basic program activities designated for grades 10, 11, and 12. A further design goal was that there should be at least 50 students in each of those grade levels in each of the participating schools. Twenty Basic secondary districts met these criteria, and all were selected. Thus, as in the Pilot program, the sample was identical to the evaluation universe.**

A pair of secondary schools was randomly selected from each district, using the same procedure described for the elementary samples. Even though this resulted in fewer than the 25 pairs of schools desired for the Basic secondary sample, it was decided that sampling more than one pair of schools in a district would be too great a hardship on the district. One school of each pair was randomly assigned to the treatment condition and the other school to the control condition.

C. SAMPLING STUDENTS WITHIN SCHOOLS

Student selection was the second stage of the two-stage probability sampling procedure. Although the student-level sampling procedure was similar for all three evaluation samples, the concentrations of participating students constituting the evaluation universes varied widely across schools and across evaluation samples. In roughly 38% of the Pilot and Basic elementary schools,

---

* There were some later adjustments to the Basic elementary sample to meet special conditions in certain districts. Final adjustments to this sample and to the Pilot elementary and Basic secondary samples are described in Chapter III.

** As in the Pilot and Basic elementary samples, later sample adjustments were required in some Basic secondary districts to meet special conditions (see Chapter III).

1% to 30% of the students were participating in ESAA programs, while in 25% of these schools, 31% to 60% of the students were involved in ESAA activities. In the remaining 38% of the Pilot and Basic elementary schools, between 61% and 100% of the students were participating.

The Basic secondary schools had a somewhat different pattern than the elementary schools. A larger percentage of these schools (48%) had between 61% and 100% of their students participating in ESAA activities; a smaller percentage of schools (28%) had only 1% to 30% of their students participating in ESAA. Approximately 25% of the Basic secondary schools had 31% to 60% of their students participating in ESAA.

Rosters of students participating in ESAA were requested, by grade, from treatment schools. The control schools were asked to provide rosters of students who would have received the same ESAA-funded services as the treatment school, if they had not been designated as control schools. Students with severe mental, physical, or linguistic handicaps were excluded from all rosters.

Students' names were chosen by a random procedure within grade from the rosters. For the third grade of the Pilot sample, 90 students, if available, were selected across all classes within a school at that grade level. The first 60 of the 90 were included in the final sample if they were present and were tested during Fall achievement testing. The remaining students were included in the sample, in the order in which they were drawn, as needed to replace absentees and to reach the desired total of 60.

The same procedures were used for Pilot fourth and fifth grades, except that 45 names were drawn for each grade (the desired final total being 30 per grade).* For the Basic samples, 90 names were drawn to obtain 60 students at each grade level.

In small schools or small ESAA programs, it was often difficult to reach the desired total of 60 or 30 students per grade. In these cases, testing personnel asked school authorities, just prior to the test day, whether any new students meeting study criteria had arrived in school since the rosters had been sent to SDC. If so, names of these new students were added to the end of the previously prepared lists, in alphabetical order, and the students were drawn into the samples as needed.

D. SUBSEQUENT SAMPLE REVISIONS

As noted above, some additional adjustments were required in the samples to meet hardship cases and other special conditions in some of the districts. In a few cases, for example, it was not possible to designate a control school in a district, and two treatment schools were selected instead; such districts were not included in the experimental (treatment-control) comparisons, but were used only for descriptive purposes. These final adjustments, and their effects on sample composition at the district and school levels, are discussed in Chapter III. Resulting student-level samples are described in Chapter IV.

---

*More Pilot students were sought at the third grade than at the fourth or fifth grade, to allow for a longer period of attrition, i.e., up to three years.

E. REPRESENTATIVENESS OF SAMPLES

Within the total universe of ESAA Pilot and Basic grant awards, constraints were imposed to limit the districts and schools from which the evaluation samples would be drawn. These constraints (selection criteria), which reflected the priority goals of the evaluation, served to define three sample universes: Pilot elementary, Basic elementary, and Basic secondary. A particularly important aspect of the sample universes was the emphasis on selection of matched pairs of designated ESAA schools within districts, so that schools could be randomly assigned to treatment and control conditions while holding district-level variables constant across each school pair.

Overall, the three evaluation samples can be assumed highly generalizable to their corresponding evaluation universes, by virtue of the procedures applied in selecting those samples. For example, at the district level, the Pilot elementary sample included all of the award districts meeting the criteria that defined the primary Pilot evaluation universe (i.e., districts with Pilot programs awarded in April or June 1973, having two or more pairable schools designated for Pilot activities in at least two consecutive grade levels of interest, and with at least 25 participating students in each of those grades). To augment this sample, several additional districts were selected that did not fully meet the criteria of the primary Pilot evaluation universe; these districts were used for descriptive purposes, but not for treatment-control comparisons. Similarly, the Basic secondary sample included all of the districts meeting the criteria of the evaluation universe, i.e., all districts receiving Basic secondary grants in April or June 1973, having two or more pairable schools with Basic program activities designated for grades 10, 11, and 12, and at least 50 participating students in each grade in each of the schools.

Selection of sample Basic elementary districts was slightly more complex, but should still have produced a sample that was highly representative of the evaluation universe. The definition of this universe was identical to that for the Basic secondary universe, but involved Basic programs at grades 3, 4, and 5 rather than at the secondary level. The selected sample included all of the districts from those polled that fully met criteria for the evaluation universe.

At the school level, it can probably be assumed that each sample (Pilot elementary, Basic elementary, and Basic secondary) was essentially representative of schools located in the selected districts and meeting the evaluation universe criteria. These school-level criteria included pairability in terms of student SES, racial/ethnic composition, and prior achievement, and sufficient numbers of students designated for participation at each grade level of interest. Within each sample group, the selected schools were a random sample of school pairs in the corresponding evaluation universe.

Finally, it can be assumed that the student samples for all three sample groups were representative of eligible students in the evaluation universes, since they were randomly drawn from designated ESAA participants at grade levels of interest in the selected schools.

Although the discussion up to this point has focused on sample representativeness with respect to the evaluation universes, another issue of concern is whether the samples were representative of the total universe of ESAA awards. Relatively little information is available on this subject, because of the lack of data on most characteristics of the award universe. Such sample-vs.-universe comparisons as can be made are presented in Chapters III and IV, which describe the sample districts, schools, and students. On *a priori* grounds, however, it was anticipated that the sample districts would represent an oversample of large and medium-sized districts and an undersample of small districts. Such a trend would be a natural consequence of the intentional emphasis on matched pairs of schools, as such pairs would not be available in many of the smallest districts.

CHAPTER III

DISTRICT, COMMUNITY, AND SCHOOL CHARACTERISTICS

This chapter is concerned with the demographic and organizational context in which ESAA programs operated during the initial year of program implementation. More specifically, descriptive information is presented on the regional and state distributions of the ESAA award universe and the sample districts; relevant features of the final data analysis sample for Year I; demographic and socioeconomic characteristics of the districts and schools conducting the sample ESAA programs; and the racial composition of the student bodies and staffs in the selected schools.

A. REGIONAL AND STATE DISTRIBUTION OF AWARD UNIVERSE AND SAMPLE DISTRICTS

1. REGIONAL DISTRIBUTION

Table III-1 shows the regional distribution of both the ESAA award universe districts and the 93* evaluation sample districts. Of the 511* districts receiving ESAA awards, almost 70% were concentrated in two HEW Regions, while three regions had less than 5% of the total awards. Regions IV and VI (Southeast and South Central regions, respectively) received the largest numbers of grants, while Region I (New England) received less than 1% of the awards and Regions VII and X (Central Midwest and Pacific Northwest) received less than 2% each.

The regional distribution for the evaluation sample was very similar to that for the award universe, as indicated by a .97 correlation between the number of districts sampled from each region and the number of districts receiving awards in that region. Almost 60% of the sample districts were located in Regions IV and VI, reflecting the heavy concentration of Basic and Pilot program grant awards in those areas. No sample districts were drawn from Region I (New England) or Region VIII (Western Mountain), which together received only 4% of the total awards.

2. STATE DISTRIBUTIONS

Table III-2 presents the distributions of award districts and funds in the Pilot award universe and the Pilot sample. Thirty-five percent of the districts receiving Pilot awards were represented in the sample. The sample districts

---

*This total figure counts districts that received both Pilot and Basic awards as two districts.

TABLE III-1. GEOGRAPHIC DISTRIBUTION OF AWARD AND SAMPLE ESAA DISTRICTS

HEW Region	Geographic Region	States	Number of Award Districts*	Percentage of Total	Number of Sample Districts	Percentage of Total
I	New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	5	1	0	0
II	Metropolitan Northeast	New Jersey, New York (also includes Puerto Rico, Virgin Islands)	41	8	9	11
III	Mid-Atlantic	District of Columbia, Delaware, Maryland, Pennsylvania, Virginia, West Virginia	48	9	9	11
IV	Southeast	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee	183	36	22	28
V	North Midwest	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin	20	4	7	9
VI	South Central	Arkansas, Louisiana, New Mexico, Oklahoma, Texas	162	32	23	29
VII	Central Midwest	Iowa, Kansas, Missouri, Nebraska	8	2	2	2
VIII	Western Mountain	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming	16	3	0	0
IX	Pacific Southwest	Arizona, California, Hawaii, Nevada (also includes American Samoa, Guam, Pacific Trust Territories)	20	4	5	6
X	Pacific Northwest	Alaska, Idaho, Oregon, Washington	8	2	3	4
		TOTAL	511	100	80	100

*If a district received both Pilot and Basic awards it is counted twice.

TABLE III-2. STATE DISTRIBUTION OF AWARDS IN PILOT UNIVERSE AND SAMPLE

State	Number of Award Districts	Total Dollars Awarded to Districts in State	Number of Sample Districts	Dollars Awarded to Districts Represented in Sample	Percentage of Funds Awarded to Districts Represented in Sample
Alabama	6	729,864	4	502,079	68.8
Arizona	2	287,157	2	287,157	100.0
Arkansas	9	502,610	2	144,430	28.7
California	2	387,896	1	58,590	15.1
Florida	4	699,623	2	567,699	81.1
Georgia	7	901,580	2	254,142	28.2
Louisiana	7	986,090	2	416,910	42.3
Missouri	1	443,767	1	443,767	100.0
New Jersey	4	1,174,452	3	1,113,096	94.7
New Mexico	6	495,400	2	179,770	36.3
New York	3	5,575,188	1	510,743	9.2
Ohio	2	921,781	2	921,781	100.0
Pennsylvania	2	1,578,260	1	1,456,510	92.3
South Carolina	8	1,250,123	2	330,345	26.4
Texas	11	2,151,750	3	501,540	23.3
Virginia	7	861,760	4	505,086	58.6
TOTAL for States Represented in Sample	81	18,974,301	34	8,192,645	43.2
TOTAL for States Not Represented in Sample	17	2,361,460	0	0	0.0
TOTAL for All States	98	21,308,761	34	8,192,645	38.4

received 38% of all Pilot funds and over 43% of the Pilot funds in the sample states. In seven of the 16 states represented in the sample, over 50% of the Pilot award dollars were accounted for by districts selected for the sample.

The correlation between numbers of sample districts in each state and numbers of districts in those states receiving ESAA awards was .54; this is a moderate relationship, but shows weaker representativeness than that at the regional level. A still lower correlation (.20) was found between the amount of funding received by sample districts in each state and the total ESAA funding for all districts in that state. It should be noted, however, that the evaluation design did not place major emphasis on either regional or state representativeness of the sample. Rather, the sample design focused on the inclusion of matched pairs of treatment and control schools; this requirement led to an oversampling of larger urban districts and, at the state level, undoubtedly detracted from the overall representativeness of the sample with respect to numbers of funded districts and levels of funding.

Table III-3 shows data on sample and award distribution by states for the Basic award universe and the combined Basic sample. Fourteen percent of the districts receiving awards were represented in the sample. Sample districts received 29% of all Basic funds and 32% of funds awarded in states represented in the sample. In nine of the 25 states, over 50% of the Basic award dollars were accounted for by sample districts. The correlation between the number of sample districts in each state and the number of districts in the state receiving awards was .56, indicating a moderate degree of association. The correlation between the amount of funding received by sample districts and that received by all districts in the sample states was .66, indicating a fair degree of relationship.

3. REGIONAL DISTRIBUTION OF SAMPLE SCHOOLS

The regional distribution of sample schools, shown in Table III-4, is similar for all three evaluation samples. Regions IV and VI (Southeast and South Central) had the largest numbers of sample schools, reflecting the concentration of ESAA-funded districts and schools in those regions. The percentages of sample schools that were located in Regions IV and VI ranged from 51% for the Pilot sample to 79% for the Basic secondary sample. The smallest number of sample schools was located in Region X, which had six Basic elementary schools, but no Pilot elementary or Basic secondary schools.

4. SUMMARY OF GEOGRAPHIC REPRESENTATIVENESS OF SAMPLE

As noted in Chapter II, the Pilot elementary and Basic secondary evaluation samples included the total universe of districts meeting the selection criteria, and the Basic elementary sample included most districts meeting those criteria. There seems little doubt, therefore, that all three evaluation samples were highly representative of their corresponding evaluation universes in all relevant dimensions including geographic distributions. The present chapter examined the extent to which the evaluation samples were geographically representative of the ESAA award universes. Although such representativeness was not a major design goal of the evaluation, a very high correlation was found across the evaluation samples between the number of districts receiving ESAA awards in each region and the number of sample districts in that region. Geographic representativeness

TABLE III-3. STATE DISTRIBUTION OF AWARDS IN BASIC UNIVERSE AND SAMPLE

State	Number of Award Districts	Total Dollars Awarded to Districts in State	Number of Sample Districts	Dollars Awarded to Districts Represented in Sample	Percentage of Funds Awarded to Districts Represented in Sample
Alabama	29	5,582,978	4	1,650,435	29.6
Arkansas	30	2,890,890	2	377,840	13.1
California	15	7,645,595	2	739,631	9.7
District of Columbia	1	1,962,418	1	1,962,418	100.0
Florida	12	6,755,357	3	1,621,636	24.0
Georgia	28	5,371,583	1	1,033,053	19.2
Illinois	9	3,104,791	2	770,288	24.8
Indiana	1	447,883	1	447,883	100.0
Kansas	3	614,575	1	457,849	74.5
Louisiana	23	4,240,180	4	947,220	22.3
Maryland	3	1,892,966	1	1,019,471	53.9
Michigan	2	590,000	1	459,000	77.8
Mississippi	12	3,335,474	2	1,878,799	56.3
Missouri	3	892,667	1	674,798	75.6
New Jersey	9	1,323,604	2	370,416	28.0
New Mexico	9	1,178,140	2	429,400	36.4
New York	9	11,716,609	5	3,016,719	25.8
North Carolina	32	8,265,258	2	616,882	7.5
Ohio	3	695,765	1	262,612	37.7
Pennsylvania	9	2,868,951	3	1,429,279	49.8
South Carolina	26	4,624,806	2	733,259	15.8
Tennessee	9	4,911,074	4	3,075,195	62.6
Texas	50	10,669,100	7	5,070,020	47.5
Virginia	22	5,449,571	2	1,031,224	18.9
Washington	4	838,210	3	801,920	95.7
TOTAL for States Represented in Sample	353	97,868,445	59	31,147,247	31.8
TOTAL for States Not Represented in Sample	60	8,405,239	0	0	0.0
TOTAL for All States	413	106,273,684	59	31,147,247	29.3

TABLE III-4. REGIONAL DISTRIBUTION OF SAMPLE SCHOOLS

HEW Region	Geographic Region	PILOT		BASIC ELEMENTARY		BASIC SECONDARY	
		Number of Schools	Percentage of Total Pilot Schools	Number of Schools	Percentage of Total Basic Elementary Schools	Number of Schools	Percentage of Total Basic Secondary Schools
II	Metropolitan Northeast	10	15	4	5	2	7
III	Mid-Atlantic	10	15	6	8	2	7
IV	Southeast	19	29	26	34	14	46
V	North Midwest	6	9	6	8	2	7
VI	South Central	14	22	20	27	10	33
VII	Central Midwest	1	2	4	5	0	0
IX	Pacific Southwest	5	8	4	5	0	0
X	Pacific Northwest	0	0	6	8	0	0
	TOTAL	65	100	76	100	30	100

was considerably more modest at the state level, and when looking at ESAA dollars awarded rather than at number of district grants awarded.

B. DATA ANALYSIS SAMPLE FOR YEAR I

A certain amount of shrinkage in the sample of schools selected for the ESAA evaluation occurred between the final sampling of districts and the pretest administration. In many cases, adjustments were made so that districts could remain in the sample, but in some instances, districts were dropped from the study. In addition, some attrition in the study sample occurred between the Fall of 1973 and the Spring of 1974. All adjustments and changes to the original evaluation sample are discussed below, and the final Year I samples resulting from these adjustments are described. The sample modifications are not mentioned again in subsequent chapters, but analyses reported in those chapters are based on the adjusted samples unless otherwise noted.

1. ADJUSTMENTS

The great majority of selected districts agreed to participate as stipulated in the sampling design. However, some districts stated that their participation would create severe problems at the local level. Generally, these latter districts requested one of the following:

a) the selection of an alternative control school, either because the selected school had the greatest need in the district for the funds or because ESAA activities were required under a desegregation plan.

b) the exemption of the selected control school from that status, because having a control school would result in serious educational and/or political repercussions.

These requests were handled in a variety of ways, depending upon the specifics of each request. Where hardships were claimed, resolutions were worked out directly between USOE and the districts. In some cases it was necessary to select new pairs of schools; when this occurred, those pairs were randomly drawn and the treatment-control conditions were randomly assigned. In other cases, treatment and control sections were established within schools. These sections contained students who were randomly assigned to treatment and control classes. Finally, in some control schools, limited ESAA activities were allowed in specified grades outside the grades of interest in the evaluation.

Because of the comparatively small number of secondary schools in most districts, secondary control schools tended to create the greatest burden for districts. Some districts requested that no control schools be employed, and it occasionally appeared that no control-type adjustment was reasonably possible; pairs of treatment schools were selected in these cases, but were not included in any treatment-control comparisons.

In addition to these adjustments, several districts made changes in their programs during the year that caused them to fall outside the boundaries of the survey universe. For example, some districts withdrew from ESAA, and some districts reassigned funds to grade levels not in the study or to schools not selected for participation. In these cases, the districts were dropped from the study. Also, two large urban districts in eastern cities did not release spring questionnaire and posttest data until it was too late to include them in the Year I analyses. One district had a large percentage of Black students and the other had the largest Spanish-descent population of the districts originally included in the evaluation sample.

2. ATTRITION IN SAMPLE SIZE BETWEEN PRETEST AND POSTTEST ADMINISTRATION

Exclusive of schools in the two large urban districts where posttest data were not available, the pretest sample consisted of 21,699 students in 180 schools; 19,573 of these students were posttested, for an overall attrition rate the first year of only 9.8%.

As would be expected, the attrition rate for secondary students was much higher than for elementary students (17.7% for secondary students vs. 7.4% for elementary students). Within the elementary level, the three grades had almost identical attrition rates. For the secondary students, however, the rate of attrition increased markedly in the twelfth grade. This may be in part explained by students' reaching an age where they were no longer subject to compulsory education requirements. Overall, elementary students in Basic programs had a slightly higher attrition rate than those in Pilot programs (7.9% vs. 6.4%).

Among students whose ethnicity could be established, the highest attrition rate in the Pilot and Basic elementary samples occurred among White students (approximately 9%). In secondary schools, Blacks and Whites had virtually identical attrition rates (17%). There was no difference in attrition rate between treatment (ESAA-funded) schools and control (non-funded) schools for any of the three evaluation samples.

In both elementary groups, a much higher than average attrition rate occurred in HEW Region VII (Central Midwest); in the Basic elementary programs only, a similarly high rate occurred in Region IX (Western states). Among Basic secondary schools, three of the four regions represented had quite similar attrition rates. However, in Region II (New York and New Jersey) the rate was double that in the other regions.

An important question was whether the shrinkage in sample size was selective in terms of achievement level; that is, were the students who dropped out substantially higher or lower in terms of their pretest achievement scores than those students who were still in school at the time of the posttest? On all measures, in all but one instance (Basic elementary Grade 5--Reading Vocabulary), the pretest means of the students who were not posttested were lower than the means for the students who were posttested. This difference in scores was greater at the secondary level than at the elementary level, presumably because of the greater attrition rate in high schools. For example, in the twelfth grade, where student attrition due to dropouts was particularly heavy, the difference in scores for pretest-only and pretest-posttest students was largest.

The evidence seems quite clear that, overall, it was the poorer-achieving students who left school, either as dropouts or as transfers. To this extent, any findings concerning student gains in achievement test scores may not be entirely generalizable to the original (pretest) sample, which included a larger proportion of the slower students than the final posttest sample. No systematic differences were found between treatment and control schools in attrition rates or in the pretest achievement levels of students not present for posttesting.

3. SCHOOLS IN FINAL (PRETEST-POSTTEST OVERLAP) EVALUATION SAMPLE

The final Year One evaluation sample consisted of schools for which complete pretest-posttest achievement data were collected. Table III-5 shows the distribution of treatment and control schools in the three sample groups on which all Year One analyses were performed. Overall, the Pilot sample consisted of 18 treatment-control pairs and 29 unpaired treatment schools; the Basic elementary sample consisted of 38 pairs; and the Basic secondary sample consisted of 12 pairs and six unpaired treatment schools. However, the distribution of paired treatment and control schools and unpaired treatment schools differed at each grade level. As the table indicates, there were some school pairs and unpaired schools where only one or two grade levels were represented. The last two columns of the table specify the number of paired and unpaired schools with student participation at all three grade levels.

School units were divided into separate schools (i.e., schools in a feeder-fed relationship where grade 3 is in one school and grades 4 and 5 are in another). Also, treatment-control sections within schools have been separated and treated as separate schools.

In the experimental analyses it was appropriate to look only at the paired treatment and control schools in each sample. The descriptive analyses included the unpaired treatment schools as well. The composition of the sample used for each type of analysis is specified where appropriate, in later sections of this report.

C. RACIAL/ETHNIC COMPOSITION OF STUDENTS AND STAFFS IN SAMPLE DISTRICTS AND SCHOOLS

1. SAMPLE DISTRICTS

District student body racial/ethnic composition, which was a major factor determining district Basic and Pilot award eligibility, is presented by HEW Region in Table III-6. These figures are based on district-level data collected by the U.S. Office of Civil Rights; racial/ethnic groups were categorized as "White (Anglo)," "Black," "Spanish-surnamed," "Asian," or "American Indian." Blacks were by far the largest minority group, followed by Spanish-surnamed students.

U.S. Department of HEW Regions showed varying degrees of racial/ethnic heterogeneity. For example, Region X (Pacific Northwestern states), which included only sample Basic award districts, had extremely light minority-group representation among students, with very little variation. On the other hand, regions that included both sample Pilot and sample Basic award districts

TABLE III-5. TREATMENT-CONTROL SCHOOL DISTRIBUTION FOR SAMPLE SCHOOLS IN YEAR I (1973-1974) BY PROGRAM TYPE

Evaluation Group	Grade Level	Number of Treatment Schools in T-C Pairs*	Number of Control Schools in T-C Pairs**	Number of Unpaired Treatment Schools	Number of Treatment-Control Pairs at All Grade Levels	Number of Unpaired Treatment Schools at All Grade Levels
Pilot	3	15	15	21	14	14
	4	18	18	24		
	5	17	17			
Basic Elementary	3	36	36	0	33	0
	4	36	36	0		
	5	35	35	0		
Basic Secondary	10	12	12	6	11	6
	11	11	11	6		
	12	12	12			

*Includes treatment-control sections within a single school.

**Includes both schools in feeder-fed school units.

TABLE III-6. RACIAL/ETHNIC COMPOSITION OF STUDENTS IN SAMPLE DISTRICTS, BY REGION

HEW Region	Geographic Region	Anglo		Black		Spanish		Asian		American Indian		Total Students
		$\overline{\%}$*	S.D.	$\overline{\%}$*	S.D.	$\overline{\%}$*	S.D.	$\overline{\%}$*	S.D.	$\overline{\%}$*	S.D.	
II	Metropolitan Northeast	36.2	17.3	35.9	7.9	25.8	10.0	1.9	0.7	0		1,158,466
III	Mid-Atlantic	41.7	26.4	56.8	26.2	0.6	0.8	0.6	0.3	0		337,338
IV	Southeast	45.5	21.9	54.1	22.1	0.1	0.2	0.1	0.1	0		608,305
V	North Midwest	81.0	7.2	17.9	6.5	0.4	0.4	0.4	0.6	0		79,642
VI	South Central	50.7	23.8	35.6	22.9	13.2	28.4	0.2	0.1	0.1	1.5	493,897
VII	Central Midwest	58.7	19.4	37.5	19.4	2.8	0.3	0.2	0.1	0.5	0.3	117,527
IX	Pacific Southwest	53.1	10.3	10.4	3.1	35.1	13.2	1.0	0.1	0.1	0.1	33,520
X	Pacific Northwest	75.8	2.5	14.7	3.0	1.8	4.0	6.0	3.0	1.4	0.5	75,270

*"$\overline{\%}$" designates mean percentage.

showed more racial/ethnic diversity among districts. Heavy concentrations of minority students were especially evident in districts in Regions III and IV (Mid-Atlantic and Southeastern), with an average of more than 50% Black student enrollment. Regions II and IX (Northeast and Pacific Southwest) had an average of at least 25% Spanish-surnamed students.

Staff racial/ethnic composition estimates were obtained from ESAA district superintendents and included racial/ethnic breakdowns for teachers, administrators, and clerical staff. The general pattern showed non-minority-group dominance among ESAA district staff. Regions III and IV (Mid-Atlantic and Southeast, respectively), however, reflected considerable racial heterogeneity in the staff, especially at the teacher level. In these cases, where average Black student enrollment exceeded 50%, Black and White teachers tended to be almost evenly distributed. The South Central and Pacific Southwest Regions (Regions VI and IX), which had substantial percentages of Spanish-surnamed students, showed at least 10% Spanish-background representation on the average across all staff levels.

2. SAMPLE SCHOOLS

Table III-7 presents the student racial/ethnic composition of sample schools in the three evaluation groups. This information is based on questionnaire responses of the school principals. In both Pilot and Basic student bodies, Blacks were by far the major minority group represented, followed by Spanish-background students.

TABLE III-7. STUDENT RACIAL/ETHNIC GROUP COMPOSITION IN SAMPLE SCHOOLS

Racial/Ethnic Group	Pilot (Total N = 65)			Basic Elementary (Total N = 76			Basic Secondary (Total N = 30)		
	$\bar{\%}$ *	S.D.	N	$\bar{\%}$	S.D.	N	$\bar{\%}$	S.D.	N
White/Anglo	21.8	14.2	37	55.7	26.3	62	56.4	32.8	26
Black	65.1	29.3	37	38.0	26.9	62	41.0	31.0	25
Spanish-Background	11.6	26.8	37	4.4	14.0	62	0.5	1.2	26
Other	1.4	4.5	37	2.1	7.7	62	1.0	2.1	25

*"$\bar{\%}$" designates mean percentage.

Pilot program objectives were focused on assisting children in minority-impacted schools, that is, schools exceeding 50% minority-group enrollment. Thus, it is not surprising that Pilot schools had heavier minority-student enrollment and greater minority representation among school staff than did Basic schools. In contrast to Pilot programs, Basic elementary and secondary sample schools were characterized by more racially-mixed student bodies.

Racial/ethnic student body composition varied considerably among sample schools within the three evaluation groups. Table III-8 shows the frequency distributions of the percentage of minority students represented in the student bodies of the sample schools. All but one of the Pilot sample schools had 50% or more minority-group enrollment; Basic sample schools varied more widely in the percentage of minority students. Although the Basic ESAA grants were for districts that had desegregated or were in the process of desegregation during the 1974-75 school year, several of the Basic elementary and secondary schools in the sample had student bodies that were either virtually all non-minority or predominantly minority. Thus, the mean percentages of each racial/ethnic group specified in Table III-7 for the aggregated Basic sample may be somewhat misleading. As Pilot sample schools had consistently high percentages of minority students, the mean percentages presented in Table III-7 for this sample are more interpretable.

TABLE III-8. PERCENTAGE OF MINORITY STUDENTS REPRESENTED IN SAMPLE SCHOOLS IN THE THREE EVALUATION GROUPS

Percentage of Minority Students	Number of Pilot Sample Schools (Total N=65)	Number of Basic Elementary Sample Schools (Total N=76)	Number of Basic Secondary Sample Schools (Total N=30)
0-10	0	0	0
11-20	0	9	4
21-30	0	15	2
31-40	0	13	3
41-50	1	7	4
51-60	4	2	1
61-70	8	3	1
71-80	9	5	1
81-90	8	2	1
91-100	7	5	3
Number of Missing Cases	28	15	5

Table III-9 shows staff racial/ethnic composition in sample schools at teacher, administrator, and clerical levels. For all samples, but particularly for the Pilot sample, the percentage of minority-group staff members was considerably lower than the percentage of minority-group students.

The average percentages of minority students and staffs in paired treatment and control schools are shown for each evaluation group in Table III-10. There were no statistically significant treatment-control differences in the percentages for any of the evaluation groups. At the student level, these results indicate success in obtaining treatment and control school pairs that were matched in minority-group representation.

TABLE III-9. STAFF RACIAL/ETHNIC COMPOSITION IN SAMPLE SCHOOLS

Racial/Ethnic Group	Pilot (Total N=65)			Basic Elementary (Total N=76)			Basic Secondary (Total N=30)		
	$\overline{\%}$*	S.D.	N	$\overline{\%}$	S.D.	N	$\overline{\%}$	S.D.	N
TEACHERS									
White/Anglo	51.8	20.6	51	67.8	23.3	76	73.4	18.7	28
Black	36.8	23.8	50	28.9	21.3	76	25.4	18.9	28
Spanish-Background	6.8	16.0	50	4.3	16.9	76	0.4	0.7	28
Other	0.4	2.2	49	1.0	2.9	76	0.8	3.8	28
ADMINISTRATORS									
White/Anglo	43.0	43.6	49	74.8	38.7	75	64.2	33.9	28
Black	38.0	43.9	51	18.6	35.7	76	33.6	33.8	28
Spanish-Background	11.2	29.1	48	2.0	12.6	75	0	0	28
Other	1.0	9.1	48	3.1	11.2	74	2.2	6.3	28
CLERICAL STAFF									
White/Anglo	48.8	44.8	51	68.9	37.9	75	71.6	34.1	28
Black	41.2	45.1	51	22.3	35.3	76	27.4	34.2	28
Spanish-Background	7.1	21.8	50	5.1	18.7	75	0	0	28
Other	1.9	13.7	50	3.4	11.7	75	0.9	1.0	28

*"$\overline{\%}$" designates mean percentage.

TABLE III-10. PERCENTAGES OF MINORITY STUDENTS AND STAFF IN SAMPLE GROUPS

Sample Group	Treatment Schools in T-C Pairs			Control Schools in T-C Pairs		
	$\overline{\%}$*	S.D.	N	$\overline{\%}$	S.D.	N
A. Pilot Evaluation Sample						
STUDENTS	80.0	18.0	6	73.2	14.6	6
Number of Missing Cases			12			12
TEACHERS	45.9	21.0	10	49.8	22.8	10
Number of Missing Cases			8			8
ADMINISTRATORS	49.3	44.1	11	73.3	45.8	11
Number of Missing Cases			7			7
CLERKS	55.3	46.3	11	73.3	45.8	11
Number of Missing Cases			7			7
B. Basic Elementary Evaluation Sample						
STUDENTS	43.0	23.9	26	39.4	23.5	37
Number of Missing Cases			12			1
TEACHERS	32.8	21.8	37	31.8	23.5	37
Number of Missing Cases			1			1
ADMINISTRATORS	27.3	41.2	36	23.6	37.7	36
Number of Missing Cases			2			2
CLERKS	31.2	37.3	36	32.1	39.8	36
Number of Missing Cases			2			2
C. Basic Secondary Evaluation Sample						
STUDENTS	42.0	35.5	8	44.0	36.8	8
Number of Missing Cases			4			4
TEACHERS	24.6	20.2	10	29.5	21.7	10
Number of Missing Cases			2			2
ADMINISTRATORS	34.3	38.2	10	39.8	41.5	10
Number of Missing Cases			2			2
CLERKS	34.6	36.5	10	34.1	42.5	10
Number of Missing Cases			2			2

*"$\overline{\%}$" designates mean percentage.

3. CORRELATION BETWEEN PERCENTAGE OF MINORITY STUDENTS AND PERCENTAGE OF MINORITY STAFF WITHIN SAMPLE SCHOOLS

Given the discrepancy between percentage of minority-group representation in student enrollment and on school staffs, particularly in the Pilot sample, it was of interest to determine how strongly the two minority-group measures correlated across schools. Correlation coefficients (Pearson's r) were computed between the percentages of minority staff members at the different sample schools and the percentages of minority students in those same schools.

In the Pilot evaluation sample, the percentage of minority teachers and the percentage of minority students were not significantly correlated ($\alpha = .05$) in either treatment or control schools; one possible inference is that there was no personnel policy in the Pilot districts for attempting to achieve racial/-ethnic balance of teaching staff composition with student body composition. However, in the treatment schools, percentage of minority students did correlate significantly with percentage of minority administrators and clerical staff.

Sample Basic programs showed much greater correspondence between staff racial/-ethnic composition and student body racial/ethnic composition than the Pilot programs. The percentages of minority membership at each staff level were significantly correlated (the r's range from .45 to .94) in both treatment and control schools at the elementary and secondary levels. In terms of overall regional distributions, the Mid-Atlantic and Southeast regions, which had the highest concentrations of minority students, also had the largest percentages of minority staff members.

4. SUMMARY

At the district level, the HEW Regions showed considerable variability in student racial/ethnic composition. The Mid-Atlantic and Southeastern regions showed heavy concentrations of Black students (over 50%), while concentrations of Spanish-surname students were evident in the Northeast (26%) and Pacific Southwest regions (35%). Minority-group students were least represented in the Pacific Northwest region, where Blacks (15%) were the largest minority group represented, and where the largest concentrations of Asians (6%) was found compared to other regions.

At the school level, Pilot sample schools (by definition "minority impacted") showed more than 50% minority-group enrollment, while Basic sample schools were more racially heterogeneous. Blacks were generally the major minority group represented, followed by Spanish-surname students. The percentage of Spanish-surname students reported in Basic secondary schools was extremely small.

The percentages of minority staff personnel were consistently lower, district for district, then the corresponding percentages of minority student enrollment. Overall, there was a better correspondence (higher correlation) between the student and staff minority-percentage figures in Basic sample schools than in Pilot schools. Districts in the Mid-Atlantic and Southeast regions, which had high concentrations of minority students, also tended to have racially balanced teaching staffs.

D. COMMUNITY, DISTRICT, AND SCHOOL CHARACTERISTICS

1. SIZE OF SURROUNDING COMMUNITIES

One contextual dimension of interest in characterizing sample ESAA programs is the size of the embedding communities. For summary purposes, communities with populations of 50,000 or greater (including suburbs) were classified as "medium/large," while communities of under 50,000 were considered "small." By this definition, Basic sample schools were predominantly set in medium/large communities (see Table III-11); 66% of sample Basic elementary schools and 79% of sample Basic secondary schools operated in such communities. By contrast, the Pilot sample showed wider community-size distribution, with about even proportions of small and medium/large districts.

TABLE III-11. COMMUNITY-SIZE CONTEXT OF SAMPLE PROGRAMS

Size of Community	Pilot Sample (N=65) (Percentage of Total)	Basic Elementary Sample (N=76) (Percentage of Total)	Basic Secondary Sample (N=30) (Percentage of Total)
Small	53	34	21
Medium/Large	47	66	79
TOTAL N	55	76	28
Number of Missing Cases	10	0	2

As mentioned earlier, large metropolitan areas in the Northeast area were not represented in this evaluation, but many of the sample schools were drawn from large cities and suburbs in other areas such as the South Central, Southeast, and Midwest regions.

2. SIZE OF SAMPLE DISTRICTS AND SCHOOLS

Table III-12 shows the distribution of enrollment sizes in sample districts and schools. District enrollment size, defined by the average daily attendance, varied widely within the sample. The average enrollment was approximately 25,000 pupils, but the range was from slightly under 400 pupils to over 200,000. The substantial proportion (43%) of relatively large districts (greater than 10,000 enrollment) in the sample is especially noteworthy. Wide variability in enrollment is also evident at the school level, with values ranging from about 50 pupils to over 2,800 pupils. However, over half of the schools had enrollments in the range of 300 to 700 pupils.

3. PERCENTAGE OF DISADVANTAGED STUDENTS IN DISTRICTS AND SCHOOLS

A measure assumed to be related to student body socioeconomic status (SES) was the proportion of disadvantaged students, as defined by the Federal

TABLE III-12. DISTRICT AVERAGE DAILY ATTENDANCE (ADA) AND TOTAL SCHOOL ENROLLMENT

District			School		
Enrollment	Frequency	Percentage	Enrollment	Frequency	Percentage
401-1000	2	3	51-100	5	3
1001-1500	2	3	101-200	5	3
1501-2000	6	8	201-300	10	6
2001-2500	2	3	301-400	18	11
2501-3000	3	4	401-500	34	20
3001-3500	2	3	501-600	20	12
3501-4000	1	1	601-700	17	10
4001-4501	1	1	701-800	11	7
4501-5000	2	3	801-900	8	5
5001-6000	1	1	901-1000	7	4
6001-6500	3	4	1001-1100	8	5
6501-7000	3	4	1101-1200	3	2
7001-8000	2	3	1201-1300	3	2
8001-9000	7	10	1301-1400	0	0
9001-10,000	3	4	1401-1500	1	0.5
10,001-15,000	5	7	1501-1600	3	2
15,001-20,000	3	4	1601-1700	1	0.5
20,001-30,000	7	10	1701-1800	6	4
30,001-40,000	3	4	1801-1900	2	1
40,001-50,000	3	4	1901-2000	2	1
50,001-60,000	3	4	2001-2100	1	0.5
60,001-70,000	3	4	2101-2200	1	0.5
70,001-100,000	1	1	2201-2400	0	0
100,001-200,000	3	4	2401-2800	1	0.5
200,000 +	1	1	2800 +	1	0.5
TOTAL	72	100	TOTAL	168	100
Mean	25075.31		Mean	714.33	
S.D.	39735.07		S.D.	497.52	

requirements of the Elementary and Secondary Act (ESEA), Title I, at the district and school levels. Estimates of these proportions were obtained from sample district superintendents and school principals. It should be noted that the results obtained from these two sources may not be directly comparable; district-level estimates of Title-I-eligible students are defined solely in terms of economic need, while the school-level estimates by the principal may tend to reflect educational need as well.

a. District-Level Distribution

Table III-13 summarizes the regional variation in percentages of economically "disadvantaged" students in sample districts. Region III (Mid-Atlantic), Region IV (Southeast), Region VI (South Central), and Region IX (Pacific Southwest) at the elementary-school level showed relatively depressed SES levels, with average figures of about one-third or more disadvantaged students. These regions also had heavy minority-group representation in the student body.

There were consistently larger proportions of disadvantaged students at the elementary level than at the secondary level; Region II (Metropolitan Northeast), Region III (Mid-Atlantic), and Region VI (South Central) showed at least 10% difference in the proportions at the two school levels. These differences may reflect a tendency of the most severely disadvantaged students to drop out before or during high school.

b. School-Level Distribution

Table III-14 shows average percentages of "disadvantaged" students for Pilot and Basic treatment-control school pairs and for Pilot unpaired treatment schools. Some caution is required in interpreting these figures, because estimates of the percentages were not available for some school pairs, particularly in the Pilot elementary and Basic secondary samples.

Consistent with the "minority-group isolated" characterization of districts having Pilot programs, Pilot sample schools had a substantially higher average percentage of educationally/economically disadvantaged students than Basic schools. Estimates in Pilot sample schools ranged from around 50% (paired treatment schools) to around 66% (paired control schools); by comparison, Basic elementary sample school pairs were generally closer to about 39%, and Basic secondary sample school pairs showed still lower estimates of about 30%. There were no statistically significant treatment-control differences between paired schools in any evaluation group.

In general, the school-level estimates of percentage of disadvantaged Pilot and Basic elementary sample students exceeded the district-level estimates. This finding appears to be consistent with the contention, noted earlier, that school principals included educational need as well as economic need in making their estimates of percentages of disadvantaged students.

TABLE III-13. SES DISTRIBUTION OF STUDENTS IN SAMPLE DISTRICTS, AS INDICATED BY PERCENTAGE OF STUDENTS ELIGIBLE FOR ESEA TITLE I FUNDS

		School Level					
		Elementary			Secondary		
HEW Region	Geographical Region	Percentage Eligible	S.D.	N	Percentage Eligible	S.D.	N
II	Metropolitan Northeast	26.3	11.0	3	12.7	5.7	3
III	Mid-Atlantic	49.8	22.5	5	36.2	19.5	5
IV	Southeast	34.5	19.3	14	27.8	20.8	14
V	North Midwest	16.3	7.8	6	13.6	7.8	5
VI	South Central	41.1	23.8	13	31.5	24.8	13
VII	Central Midwest	--	--	--	--	--	--
IX	Pacific Southwest	39.5	14.9	2	--	--	--
X	Pacific Northwest	22.0	15.6	2	20.5	17.7	2

TABLE III-14. PERCENTAGES OF STUDENTS ESTIMATED TO BE "DISADVANTAGED" UNDER ESEA TITLE I IN SAMPLE GROUPS

Sample Group	Percentage of Disadvantaged Students								
	Treatment Schools in T-C Pairs			Control Schools in T-C Pairs			Unpaired Treatment Schools		
	$\overline{\%}$	S.D.	N	$\overline{\%}$	S.D.	N	$\overline{\%}$	S.D.	N
PILOT	49.3	35.3	6	65.7	26.6	6	63.1	25.6	18
Number of Missing Cases			12			12			11
TOTAL N			18			18			29
BASIC ELEMENTARY	41.9	25.9	24	36.9	28.4	24	N.A.*		
Number of Missing Cases			14			14			
TOTAL N			38			38			
BASIC SECONDARY	29.3	22.8	4	30.3	24.8	4	N.A.*		
Number of Missing Cases			8			8			
TOTAL N			12			12			

* N.A. (not applicable) indicates that there were insufficient numbers of unpaired treatment schools in the Basic evaluation samples to be included.

4. COMMUNITY INVOLVEMENT AND DISTRICT DECISION-MAKING

a. Degree of Community's Involvement

Community participation in sample schools was defined in terms of the school principals' reports of (1) the presence of active parent organizations and the ethnic composition of their officers, (2) the presence of an active Community Policy Committee, and (3) the percentage of paraprofessional/clerical staff drawn from community resources. The existence of an active parent organization and Community Policy Committee reflects school-community interactions and provides an indication of the community's level of interest in the educational process. The percentage of paraprofessional/clerical school staff that is drawn from the community certainly reflects community participation in the school, but may, in addition, be an indication of the socioeconomic level of the school community.

Virtually all Pilot and Basic sample schools reported having an active PTA or other organized parent group. PTA leadership was predominantly mixed in racial composition in sample Pilot and Basic schools. About 20% of the sample Pilot schools reported parent groups with all-minority officers.

It is less straightforward to evaluate community involvement by the presence of an active Community Policy Advisory Committee or similar group, since this is largely determined by the nature of the community's political structure. Nevertheless, at the elementary-school level, sample Pilot schools evidenced more community involvement than sample Basic schools, with about 60% of the Pilot schools having an active community policy advisory group, in comparison to 43% of Basic elementary schools; this suggests a greater minority-group interest in decisions affecting elementary education in Pilot program communities. Over half the Basic secondary sample schools reported having an active community advisory group.

Finally, community participation can be examined in terms of the percentage of paid professional and clerical support drawn from parents of children who attend school. In Pilot sample school pairs and unpaired treatment schools, about 23% of these paraprofessionals were parents. The corresponding values for sample Basic elementary pairs and sample Basic secondary pairs were 19% and 15%, respectively.

There were no significant treatment-control differences in the Pilot or Basic sample on any of the indicators of community involvement described above.

b. Degree of Centralization of Decision-Making

Another community-involvement dimension of interest was the decentralization or centralization of decision-making in policy issues. To explore this aspect of ESAA program settings, school decision-making was examined in the following three areas: classroom curriculum and media, budget allocations, and the hiring and firing of teachers. School principals were asked to indicate the parties included in decision-making in these areas from among the following: the district, the principal, individual teachers, the staff as a whole, parents, and students.

Greater decentralization was indicated by the inclusion of many parties in decision-making, suggesting a more lateral organizational structure. Centralization was indicated by higher-level decision-making, primarily by the district and principal.

The pattern of decision-making was fairly consistent across programs. There was greater decentralization in decisions concerning classroom curriculum and media; increasing centralization in administrative decisions concerning budget allocations; and almost total centralization in decisions concerning the hiring and firing of teachers. For example, in decisions concerning classroom curriculum and media, not only were educational staff involved but parents and students were also indicated by about one-fifth of Pilot and Basic elementary sample schools; at the high-school level, moreover, over 50% of the sample schools indicated both parent and student involvement. Most Basic elementary (77%) and Basic secondary (90%) sample schools reported district involvement in decisions concerning classroom curriculum and media; by comparison, just over half the Pilot sample schools reported such district involvement. The staff as a whole was reported to be involved in curriculum decisions by the majority of Pilot sample schools (80%).

In decisions concerning the budget, a considerably smaller percentage of sample schools reported the participation of individual teachers, parents, and students. This is not surprising, since budgeting is traditionally an administrative issue. At the elementary school level, budget decisions primarily involved the staff as a whole; at the secondary level, the district and the principal were the key parties indicated.

Finally, in personnel decisions concerning the hiring and firing of teachers, the district and principal were the major parties involved in decision-making. At least 80% of Pilot and Basic sample schools indicated district participation. Principals also participated, as indicated by almost two-thirds of the Pilot sample schools and by a large majority of the Basic elementary (70%) and Basic secondary (83%) sample schools.

There were no significant treatment-control differences in school decision-making structure in either Pilot or Basic sample districts.

CHAPTER IV

STUDENT AND FAMILY CHARACTERISTICS

This chapter describes the family and student background characteristics, entrance achievement test scores, racial attitudes, attitudes toward school, and educational expectations of sample students in the Pilot elementary, Basic elementary, and Basic secondary schools at the beginning of the first evaluation year (1973-1974). Each of the three evaluation groups is discussed separately, and, where appropriate, results are discussed by grade levels. In most cases, however, results for all grade levels within a sample were very similar and are summarized under one description.

In this chapter and subsequent chapters that include comparisons of the treatment and control groups, differences between those groups are termed "significant" only when they reach the .05 level of statistical significance (i.e., they would be expected to occur by chance no more than five times in a hundred). Differences that seem interpretable and of some particular interest, but that may not reach the .05 level of significance, are characterized by terms such as "apparent trends."

A. FAMILY CHARACTERISTICS

The description of the sample students' family background characteristics focuses on three major components: family size and whether the student lived with his mother and/or father; parents' education and occupation; and two indicators of socioeconomic status (SES). These descriptions were derived from student and teacher responses to several items included in the Spring 1974 questionnaires.

1. FAMILY SIZE AND COMPOSITION

At the elementary level, family size for Basic students in all grades was typically between four and six members. For Pilot sample students in all grades, "six" and "more than eight" people were the most frequently designated family sizes. At the secondary level, "four to five" people was the most frequent response, followed by "six or seven." Most sample students (88%) in all grades and programs indicated that they lived with their mothers. Fewer sample students (64%-71%) lived with their fathers.

Treatment-control differences for family size and for number of parents living at home were not significant at any grade level in the three evaluation groups. However, there were significant differences in these dimensions at all grade levels in the three groups between minority (Black, Asian American, American Indian, Spanish-background, and "Other") students and non-minority (White) students. In general, minority students tended to have larger families (six, seven, eight or more) than non-minority students, who usually had families of two, three, four, or five people. Non-minority students were more likely than minority students to live with their mothers and/or fathers.

2. PARENTS' EDUCATION AND OCCUPATION

At the elementary level, the homeroom teacher provided estimates of the occupations and levels of education of the students' parents. Because there was a high rate of nonresponse (15%-50%) for these variables, the results must be interpreted with caution. At the secondary level, where the information was obtained from the students, nonresponse occurred less often (18%-26%).

Teachers indicated that approximately two-fifths of the mothers of Basic elementary students finished high school, as did a third of the fathers. A greater percentage of fathers (15%-18%) graduated from a four-year college than did mothers (10%). Responses for the Pilot students showed the same trends, except that more mothers (13%) and fathers (16%) failed to finish grade school than did the mothers (8%) and fathers (9%) of the Basic elementary students. Also, fewer parents of the Pilot students attended and graduated from college (4%-6%). However, when those response percentages were calculated only for minority students in the two types of programs, the differences in parents' education levels for the two programs virtually disappeared.

Basic secondary students indicated that 43% of their mothers and 35% of their fathers graduated from high school but did not attend college. Thirty-five percent of the fathers and 26% of the mothers attended college.

The most frequent occupation of mothers of Pilot, Basic elementary, and Basic secondary students was housework (46%). Service work (16%) and clerical or office work (11%) were also common. Pilot mothers also were employed in operative work (7%), which included jobs such as machine operator, assembler, welder, and taxi, truck, or bus driver. The most frequent occupations for fathers were operative work (22%), labor (17%), crafts work (10%), professional work (11%), and service work (8%).

Differences in parents' education and occupation occurred primarily between minority and non-minority groups of sample students. Parents of minority students were less likely to have completed high school or college than parents of non-minority students. In addition, minority mothers were more likely to be employed in service or operative work, while non-minority mothers were more likely to be housewives or clerical workers. Non-minority fathers were fairly often employed as managers, professionals, or salesmen, while minority fathers were more often employed in operative work, service work, or labor.

3. HOUSEHOLD POSSESSIONS

Two measures of socioeconomic status (SES) were calculated, based on different types of possessions present in the homes of the sample students. The first measure, "SES/reading," was related to the availability in the home of the following education-related materials: daily newspaper, dictionary, encyclopedia or other reference books, books of fiction and nonfiction, and magazines. The second measure, "SES/luxury possessions," indicated the number of convenience or luxury items in the home. These included a color television, typewriter, dishwasher, two or more cars or trucks that operated, and an automatic clothes dryer. Scoring on the two measures was based on a simple count of the items within each group that the student indicated were present in his home. No statistically significant treatment-control differences were found within programs for either of the SES measures.

Table IV-1 presents the frequency distribution of the number of items in SES/reading found in the homes of Basic elementary, Basic secondary, and Pilot students. The most frequent response for all groups was "five." There were statistically significant differences on SES/reading between minority and non-minority students within both Basic and Pilot programs. Minority students were more likely to indicate that they had one, two, or three of the items, while non-minority students were more likely to have all five items. Differences between the scores on SES/reading for minority Basic elementary and minority Pilot students at all grade levels were also significant; means for the minority Basic elementary students were higher than those for the minority Pilot students.

TABLE IV-1. AVAILABILITY OF EDUCATIONAL MATERIALS IN THE HOME (SES/READING) FOR BASIC ELEMENTARY, BASIC SECONDARY, AND PILOT STUDENTS

	Percentage of Students by Evaluation Sample		
SES/Reading	Basic Elementary	Basic Secondary	Pilot
0	3	1	4
1	5	2	9
2	10	4	14
3	16	9	21
4	24	21	26
5	42	62	27

Table IV-2 shows the frequency distribution of the number of items in SES/luxury possessions found in the homes of Basic elementary, Basic secondary, and Pilot students. Indicating that they had four or five of the items in their homes were 35% of the Basic elementary students, 43% of the Basic secondary students, and 20% of the Pilot students. Again, all differences in SES/luxury possessions between minority and non-minority groups in the three study groups were statistically significant. Minority students were more likely to check 0, 1, or 2 items, while non-minority students were more likely to check 4 or 5 items. Differences between the mean scores on SES/luxury possessions for the minority Basic elementary and minority Pilot students were significant at the third and fourth grades only. At these grade levels, the means for the minority Basic elementary students were higher than those for the minority Pilot students.

4. SUMMARY OF FAMILY CHARACTERISTICS

In all areas examined, statistically significant differences occurred primarily between minority and non-minority students in either program type, rather than

TABLE IV-2. AVAILABILITY OF LUXURY AND CONVENIENCE ITEMS IN THE HOME (SES/LUXURY POSSESSIONS) FOR BASIC ELEMENTARY, BASIC SECONDARY, AND PILOT STUDENTS

SES/Luxury Possessions	Percentage of Students by Evaluation Sample		
	Basic Elementary	Basic Secondary	Pilot
0	8	7	12
1	15	12	22
2	20	17	26
3	22	21	20
4	20	22	14
5	15	21	6

between treatment and control students in any evaluation sample. Within either of the programs, minority students tended to come from larger families than non-minority students. More students lived with their mothers than with their fathers, and non-minority students were more likely than minority students to live with their parents. Less than half of the parents (35%-40%) finished high school, while only 4% to 18% finished college; more non-minority than minority parents graduated from high school or college. Minority mothers and fathers tended to be employed in operative or service work; non-minority fathers generally were employed as managers, professionals, or salesmen, and non-minority mothers were usually housewives or clerical workers. Basic elementary minority students had higher levels on both SES measures than did Pilot minority students.

B. STUDENT CHARACTERISTICS

Sample student characteristics investigated in this section include sex, age, racial/ethnic group membership, academic needs (as indicated by Fall pretest achievement test scores), and student attitudes, beliefs, and expectations with regard to school and students of other racial/ethnic groups. In general, there were virtually no statistically significant differences between the treatment and control groups of students at the beginning of the first year of ESAA program implementation on any of these dimensions. This result indicates considerable success in matching treatment and control groups of sample students by random-assignment procedures.

1. SEX AND AGE

In each program for each grade, the sample included about 50% females. The percentage of females ranged from 48% to 56%. Basic secondary grades 10 and 11 were the least balanced in terms of percentages of female and male students, but even in those grades the females outnumbered males by only 12% or less.

There was no great disparity in age among the students within a grade level in the three evaluation groups. The interquartile ranges for the median age showed at most a .7 year spread.

2. RACE/ETHNIC GROUP

Eligibility requirements for the Pilot and Basic programs imply differences in school racial/ethnic composition between the programs. The Pilot program is designed to provide assistance for innovative compensatory education projects in reading and math for children in minority-isolated schools. In those schools it was not possible to achieve complete racial balance, and one or more minority groups were usually dominant. The Basic program assists schools in reducing discrimination and minority-group isolation, as well as in developing programs to improve achievement in reading and mathematics; thus, in general, one might expect better racial/ethnic balance than in Pilot program schools.

Table IV-3 gives the racial/ethnic composition by grade level for all sample students in each of the two programs, as reported by teachers. Each elementary grade level had a significantly higher percentage of Black and Spanish-background students in the Pilot sample than in the Basic sample, with a correspondingly greater percentage of White students in the Basic sample. Averaged across grade levels, the Pilot sample had 25% more Black students and 8% more Spanish-background students than the Basic elementary sample, while the Basic elementary sample had 32% more White students than the Pilot sample. Within a program at the elementary level, the inter-grade variations in percentage of any particular racial/ethnic group were small.

TABLE IV-3. RACIAL/ETHNIC COMPOSITION BY GRADE LEVEL OF THE PILOT, BASIC ELEMENTARY, AND BASIC SECONDARY SAMPLES

Grade Level	Program Type	Percentage of Students					
		Black	White	Asian American	American Indian	Spanish-Background	Other
3	Pilot Basic	68.0 44.1	11.8 45.0	-- 1.4	2.1 0.5	17.6 7.6	0.4 1.3
4	Pilot Basic	68.6 43.8	13.0 44.6	0.3 1.9	1.9 0.4	15.6 8.7	0.5 0.7
5	Pilot Basic	70.2 44.7	13.0 44.8	0.1 1.6	2.0 0.5	14.6 7.3	0.1 1.2
10	Basic	45.3	53.5	0.3	--	0.6	0.3
11	Basic	45.1	53.6	--	0.1	0.6	0.4
12	Basic	42.5	56.4	--	--	0.7	0.3

At the secondary level, the sample included only Basic students. There were almost equal numbers of Blacks and Whites at each grade level, and together these two groups made up almost 99% of the total Basic secondary sample. Thus, approximately 99% of the minority students in this sample were Black. The very small percentage of Spanish-background students resulted from sampling constraints (described previously in Chapter II) that restricted the Basic secondary sample to large urban school districts, and from the fact that the largest school district with extensive Spanish-background enrollments was not included in the final merged pretest-posttest sample. It should be noted that as a consequence, all secondary-level analyses in this report apply, for practical purposes, only to Black and White students.

There were no statistically significant differences in racial/ethnic composition between treatment and control schools in any of the three evaluation samples. Thus one of the major goals in selecting matched pairs of schools, which was to equate overall racial/ethnic composition in the treatment and control samples, was satisfied.

3. STUDENT ACADEMIC NEEDS

All elementary and secondary students in the Year I Basic and Pilot samples were pretested in the Fall of 1973 to obtain measures of their reading and mathematics skills near the beginning of the school year. The achievement tests focused primarily on reading vocabulary, reading comprehension, math computation, math concepts, and math problems (secondary level only). Data were obtained in most sample schools in a six-week period from around the middle of October to the end of November.

The evaluation design assumed that paired treatment and control schools would be closely matched in their initial achievement levels. To test this assumption, statistical analyses based on an analysis-of-variance model were performed with the treatment-control pairs of schools in each evaluation group. The results showed no significant differences ($\alpha = .05$) in pretest performance between treatment and control schools in either the Basic or Pilot samples in any of the reading or mathematics achievement areas.

The pretest achievement scores for the Pilot elementary, Basic elementary, and Basic secondary students are described below. Although "debiased" scoring systems (i.e., scoring systems that excluded items determined to be potentially biased against minority students) had been developed for some of the tests*, it was found that differences in results between the full-scale scores and the debiased scores were trivial and non-significant. Since the debiased scale scores were available for only some test forms and some grade levels, calculations of all scores reported here were based on the full set of items originally included by the test publisher. Summary tables specifying the grade equivalents and percentile rank for each subtest are included for each evaluation group. More detailed tables indicating the number of items per subtest, means, standard deviations, range of scores, percentile ranks, and grade equivalents are included in the Appendix (Tables A-1 through A-9).

a. Elementary Student Achievement in Pilot and Basic Programs

(1) Pilot Elementary Students

The percentile ranks and grade equivalents for the mean pretest scores of the Pilot and Basic elementary students (treatment and control combined) on the four subtests are presented in Table IV-4. Although the Pilot scores contained

---

*For further information on the efforts to develop debiased scales, see Ozenne, D.G., Van Gelder, N.C., and Cohen, A.J. Emergency School Aid Act National Evaluation: Achievement Test Restandardization. TM-5236/006/00, System Development Corporation, November 1, 1974.

TABLE IV-4. PRETEST ACHIEVEMENT LEVELS FOR PILOT AND BASIC ELEMENTARY STUDENTS

California Achievement Test	Percentile Ranks and Grade Equivalents for Mean Scores											
	Grade 3				Grade 4				Grade 5			
	Percentile		G.E.		Percentile		G.E.		Percentile		G.E.	
	Pilot	Basic	Pilot	Basic	Pilot	Basic	Pilot	Basic	Pilot	Basic	Pilot	Basic
Reading Vocabulary	23	36	2.1	2.6	16	28	2.4	3.0	19	31	3.2	4.0
Reading Compre-hension	23	37	2.2	2.7	18	31	2.7	3.2	21	32	3.4	4.1
READING TOTAL	20	35	2.1	2.6	16	28	2.5	3.1	19	29	3.3	4.0
Math Computation	17	23	2.2	2.4	18	24	3.1	3.3	21	28	4.0	4.3
Math Concepts	13	25	1.8	2.3	12	21	2.3	2.8	16	28	3.1	4.0
MATH TOTAL	14	22	2.1	2.4	14	21	2.8	3.2	17	27	3.8	4.2

moderate variability, all scores in the three grades represent depressed achievement test scores. Percentile ranks for the various subtests ranged in the high teens and low twenties, indicating that approximately 80% of the students throughout the country were performing better than the average Pilot student. A similar pattern can be seen by comparing the pretest grade-equivalent scores in Table IV-4 with the scores that would have been expected of students with average achievement growth (based on the publisher's national norms). Average students in grades 3, 4, and 5 are expected to have grade equivalents of 3.1 to 3.2 (third grade), 4.1 to 4.2 (fourth grade), and 5.1 to 5.2 (fifth grade) when tested at the start of the school year. The scores for the sample Pilot students were, consistently, well below those average figures.

Given the generally depressed level of test scores, Pilot students' pretest performance in all three grades was best in math computation and reading comprehension, and poorest in reading vocabulary and math concepts. None of the differences in pretest scores between the paired treatment and control schools, on any subtests, were statistically significant.

It is clear that the ESAA Pilot award process resulted in selection of districts and schools with academically needy students, as indicated by their poor pretest performance on standardized achievement tests, and that the schools, by this same criterion, selected participant students with marked academic needs. Thus, there is at least a tentative indication of a reasonable match between ESAA Pilot program resources (funding) and need at the beginning of the school year. However, it is not possible on the basis of available evidence to demonstrate that the selection process necessarily led to participation of the most needy districts, schools, or students.

(2) Basic Elementary Students

The percentile ranks and grade equivalents for the mean pretest scores of the Basic elementary students are shown in Table IV-4, beside the corresponding figures for the sample Pilot students. As in the Pilot sample, Basic elementary students had generally low achievement pretest scores, with percentiles for most subtests ranging from the low twenties to the low thirties. Scores for individuals covered a fairly broad range, indicating substantial variability in entry ability despite the overall depression of group means. This depression is confirmed by a comparison of grade-equivalent scores for the Basic elementary students (see Table IV-4) with the scores of average students. Based on national normative data, the scores for average students receiving the tests at the beginning of the school year should correspond to grade equivalents of 3.1 to 3.2 (third grade), 4.1 to 4.2 (fourth grade), and 5.1 to 5.2 (fifth grade). The Basic students' pretest performance ran from half a grade equivalent to a full grade equivalent below those average figures.

In the third grade, Basic elementary students performed best in reading comprehension and vocabulary, and less well in math computation and math concepts. For the fourth and fifth grades, Basic students were most proficient in math computation and reading comprehension, and less proficient in reading vocabulary and math concepts. None of the differences in pretest achievement means between the paired treatment and control schools were significant.

Although the achievement levels of the Basic elementary students overall were higher than those of the Pilot students, this appears to be an artifact of the racial/ethnic composition of the two groups. When only minority students in each program were considered, the achievement levels of the Pilot and Basic elementary minority students were nearly identical.

The ESAA Basic Grant award process, like that for the Pilot program, clearly led to the selection of districts and schools having students with severely depressed scores on standardized reading and math achievement tests; furthermore, the students in those schools selected for Basic program participation had acute academic needs. Although these findings certainly suggest a good matching of Basic program funds with school and student needs, again there is no direct evidence as to whether the most needy of the districts, schools, or students were selected for ESAA support.

b. Secondary Student Achievement

Because the secondary students took the Iowa Silent Reading Test for reading achievement and the California Achievement Test for math achievement, it is highly questionable whether the standard scores and subsequent percentile ranks for the two tests should be compared to ascertain relative performance in the two achievement areas. However, comparisons can be made between the grade levels within an achievement area.

The percentile ranks and grade equivalents for the mean pretest achievement scores of the Basic secondary students are presented in Table IV-5. Grade equivalents for the reading subtests of the Iowa Silent Reading Test were not provided by the publisher. The achievement test scores were quite low in all areas for grades 10, 11, and 12, with means on the math subtests yielding percentile ranks in the low twenties, and percentile ranks for the reading subtest ranging from 30 to 36. Approximately four-fifths of the students in the nation were performing better in math than these Basic secondary students, and two-thirds of the nation's students exceeded the sample students' performance in reading. The Basic secondary students were less proficient in math computation than on other math subtests, and scored slightly higher in comprehension than in vocabulary.

Differences in pretest achievement means between the paired treatment and control schools were small and non-significant at the 10th and 11th grades. At the 12th grade, however, the pretest math achievement means of the control schools were significantly higher than the corresponding scores of the paired treatment schools.

In general, the results at the secondary level agree very closely with those found in the elementary samples, and show that districts, schools, and students selected for participation in Basic secondary programs had severe academic needs at the beginning of the 1973-74 school year. Although it cannot be demonstrated that the selected students were needier than other students in the same districts and schools, it is clear that they were appropriate targets for application of the ESAA funds.

TABLE IV-5. PRETEST ACHIEVEMENT LEVELS FOR BASIC SECONDARY STUDENTS

Test	Percentile Ranks and Grade Equivalents for Mean Scores					
	Grade 10		Grade 11		Grade 12	
	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.
Iowa Silent Reading Test, Level 2						
Reading Vocabulary	32	--	33	--	34	--
Reading Comprehension	33	--	33	--	36	--
READING TOTAL	30	--	32	--	34	--
California Achievement Test, Level 5						
Math Concepts	24	8.1	23	8.4	24	8.6
Math Computation	22	7.6	21	8.2	20	8.4
Math Problems	22	7.6	20	8.1	19	8.6
MATH TOTAL	23	7.9	21	8.3	21	8.6

c. Racial/Ethnic and Sex Differences in Academic Needs

(1) Racial/Ethnic Differences

Table IV-6 shows the percentile ranks and grade equivalents for the mean pretest achievement scores in reading and math by racial/ethnic group within each of the three evaluation samples. Within the Pilot and Basic elementary samples, data are not shown for some racial/ethnic groups that had only a small number of member students. In the Basic secondary sample, only Black and White students are represented.

There were noticeable differences in pretest achievement level in total reading and total math among the various racial/ethnic groups within each evaluation sample. In general, Black and Spanish-background students had lower achievement test scores than White, Asian American, or American Indian students within each of the three samples.

TABLE IV-6. TOTAL READING AND TOTAL MATH PRETEST SCORES BY RACIAL/ETHNIC GROUP AND GRADE LEVEL

Racial/-Ethnic Group	Total Reading						Total Math					
	Grade 3		Grade 4		Grade 5		Grade 3		Grade 4		Grade 5	
	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.
Pilot Elementary												
Black	17	2.0	12	2.3	22	3.1	24	2.5	19	3.1	21	3.9
White	37	2.7	28	3.1	36	4.4	37	2.8	34	3.5	39	4.6
Asian American	I.N.*	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.
American Indian	35	2.6	23	2.9	19	3.3	38	2.8	30	3.5	31	4.4
Spanish-Background	24	2.3	33	2.6	19	3.3	31	2.6	29	3.4	26	4.2
Basic Elementary												
Black	20	2.1	14	2.4	17	3.2	26	2.5	21	3.2	22	3.9
White	55	3.2	47	3.9	49	5.0	48	3.0	46	3.9	51	5.0
Asian American	55	3.2	63	4.7	59	5.5	62	3.3	72	4.7	65	5.5
American Indian	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.
Spanish-Background	21	2.7	30	4.1	I.N.	I.N.	40	2.8	30	3.5	40	4.7
Basic Secondary												
	Grade 10		Grade 11		Grade 12		Grade 10		Grade 11		Grade 12	
Black	13	N.A.**	16	N.A.	17	N.A.	10	6.7	10	7.3	8	7.3
White	51	N.A.	52	N.A.	55	N.A.	42	9.5	40	10.1	36	10.2
Asian American	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.
American Indian	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.
Spanish-Background	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.

*I.N. indicates that there were insufficient numbers of students from the racial/ethnic group within the evaluation sample to calculate a reliable mean score.

**N.A. indicates that grade equivalents were not available from the test publishers.

(2) Sex Differences

In both the Pilot and Basic elementary samples, females had significantly higher pretest scores than males ($\alpha = .05$) in vocabulary, reading comprehension, and reading total. Although females performed better than males in total math and math computation, there were statistically significant differences between males and females in the math concepts area for only half the grade levels in the Pilot and Basic elementary sample schools. There were no consistent and statistically significant differences between males and females in the Basic secondary sample in any of the reading areas, but male students in that sample made generally higher math scores than female students.

d. Summary of Student Academic Needs

The most important implications of the consistently low pretest scores in all evaluation samples are that the ESAA award process was apparently successful in focusing on districts and schools with academically needy students, and that the schools selected needy students to participate in the ESAA programs. Even though it cannot be directly determined whether the selected schools and students were the most needy, this finding is still a very positive one, particularly in comparison with findings from earlier studies of the Elementary and Secondary Education Act (ESEA) Title I.* Those earlier studies showed that high-expenditure districts with relatively low percentages of needy children received a disproportionately high share of Title I funds; conversely, districts with high concentrations of needy children tended to receive disproportionately small shares of Title I funds.

4. STUDENT ATTITUDES, BELIEFS, AND EXPECTATIONS

This section examines the racial attitudes, school preferences, attitudes toward school, and educational expectations of the sample students. Two sources of data were used. The Elementary and Secondary Questionnaires were administered in Fall 1973 to measure the baseline racial attitudes and any changes in racial attitudes that might occur during the school year.** Additional items were also selected from the Elementary and Secondary Questionnaires administered in the Spring of 1974. The racial/ethnic group identification item for the racial attitudes questionnaires included the following categories: Black, White, Brown, and Other. Because the intent was for students to self-select their racial/ethnic group, they were not given explicit definitions of the different color designators.

---

*Cf. Wargo, Michael J., et al. ESEA Title I: A Reanalysis and Synthesis of Evaluation Data From Fiscal Year 1965 Through 1970. American Institutes for Research, Palo Alto, California, March 1972.

**Because of school concern over some items in the questionnaires, the decision was made not to administer the questionnaires at posttest time; hence only pretest data are available for the 1973-1974 school year.

Before reviewing the data, a brief note of caution should be sounded concerning the difficulty in interpreting findings that cut across schools having different racial/ethnic groups. In a school having few representatives of the group in question, these attitudes will probably be based almost entirely on general stereotyped beliefs about that group; in another school, where the group is abundantly represented, the attitude may reflect some combination of stereotyping and personal experience. Results summarized across both types of schools can thus be viewed only as overall trends not necessarily reflecting attitudes in schools having a particular racial/ethnic mix.

a. School Preferences and Beliefs About Students of Other Racial/Ethnic Groups

Most sample students favored a mixture of different racial/ethnic groups of students in their schools and classrooms. When students expressed a preference for one group, it was usually for schools or classrooms to have all members of their own race or ethnic group. Such a preference was expressed more often by White, male, and/or secondary-level students.

Sample students were asked if one racial/ethnic group caused the most trouble in school, or if one racial/ethnic group was more intelligent than the others. The prevailing opinion among Pilot and Basic elementary students in all grades was that no one racial/ethnic group created more difficulties in school than other groups, and that no specific racial/ethnic group was more intelligent than the others. However, a fairly large number of Black and Brown elementary students did indicate a belief that White students caused trouble in school.

Responses of the Basic secondary students revealed differences in racial/ethnic group stereotypes. In general, each student rated his own racial/ethnic group in the most positive light. White students were the most critical of students of other racial/ethnic groups. Roughly 58% of the students agreed that Black students were troublemakers; most of the students responding in this way were White, but a sizable number of Black students also selected this response. A substantially smaller number of students (both Black and White) felt that White students were troublemakers. Most secondary students (81.8% to 83.7%) responded that color did not have anything to do with intelligence.

b. Attitudes Toward School and Educational Expectations

Attitudes toward school were generally similar for the elementary and secondary levels. Most students felt that school was "Okay," but females and minority students were more likely than males or non-minority students to feel that they liked school "a lot." Although most students in both the elementary and secondary samples felt that the rules in their school were fair, non-minority students were more likely than minority students to express this attitude. In both the Basic and Pilot elementary groups, minority students were more likely than non-minority students to feel that they did not "belong." High-SES students in the Basic elementary grades were more likely to feel that they "belonged" in their school than were students of lower socioeconomic status.

Most sample students in both programs expressed a strong interest in getting good grades and in pursuing some type of post-high-school education. High SES, non-minority, and male (secondary-level only) students were particularly interested in college-level work after finishing high school. The social desirability of college or graduate school as an educational goal may have had a strong influence in the pattern of their responses.

"College preparatory" (36%) and "general" (25%) were the most frequent types of programs or curricula in which the Basic secondary students were enrolled. "Business" (18%), "vocational" (12%), and "work-study" (9%) were less frequently indicated. Males, non-minority students, and high SES students were likely to be enrolled in "college preparatory" or "general" programs, whereas females, minority students, and low-SES students were likely to be enrolled in "business" or "work-study" programs.

C. SUMMARY OF RESULTS: SAMPLE STUDENT CHARACTERISTICS

This chapter has described the family and student characteristics, entrance achievement test scores, racial attitudes, and attitudes toward school of sample students in the Pilot, Basic elementary, and Basic secondary schools at the beginning of the 1973-1974 school year (the first year of ESAA program implementation). Some of the highlights of this chapter include the following:

- Students in both the Pilot and Basic programs had severe academic needs at the beginning of the school year, as evidenced by their consistently low pretest scores on the standardized reading and math achievement tests. The students' performance level on these tests was generally below that of 70% to 80% of the general population of students in the grade levels of interest. The ESAA Grant Award process was evidently successful in targeting funds toward districts and schools with educationally disadvantaged students, and the schools designated needy students to participate in the ESAA program. Further research is needed, however, to determine whether the ESAA award and student selection processes resulted in participation of the most needy districts, schools, and students.

- In the Pilot programs, which by definition focused on minority-isolated schools, approximately 70% of the sample students were Black, 15% were of Spanish background, and 13% were White. Basic schools had smaller percentages of minority students (approximately 52% at the elementary level and 45% at the secondary level), and correspondingly better balance in proportions of minority and non-minority students.

- At each grade level, sample students were quite homogeneous with respect to age and were almost evenly divided between males and females.

- Sample students tended to come from large families, and to have parents with a high-school education or less, although 4% to 18% of the parents (depending on the evaluation sample involved) had completed college. Non-minority parents had, on the average, more professional or technical jobs than minority parents; they also had higher levels of socioeconomic status (SES) as indicated by reading-related materials and luxury items in the home. At the elementary level, families of Basic minority students had higher SES levels than families of Pilot minority students.

- Most students in both Pilot and Basic samples expressed no deep-seated racial prejudices. A large percentage of the students favored schools and classrooms with a mixture of different racial/ethnic groups. Expressed feelings toward school were also generally positive, with most students indicating an interest in getting good grades and in pursuing some type of post-secondary education.

CHAPTER V

RESOURCE ALLOCATIONS: FUNDS

This chapter deals with the allocation of funds among and within schools. Within-school allocations to different school activities and resources give one possible indication of program goals and priorities, while between-school allocations provide the basis for treatment-control funding comparisons representing the only experimental variable in the ESAA evaluation. The evaluation model, as noted earlier, required the random assignment of one school from a matched pair of schools in each sample district to the treatment (ESAA-funded) condition. The other school was then assigned to the control (non-ESAA) condition. The implicit assumption was that, except for the ESAA funds, the treatment and control schools in the district would be more or less equally funded.* One major purpose of the analyses reported in this chapter was to assess the validity of this assumption. In particular, it was important to determine whether there was evidence that districts assigned other funds to the control schools to "compensate" for their not receiving ESAA money. To the extent that this happened, the experimental variable would be weakened, and the chances of finding a significant difference in achievement between treatment and control schools would be correspondingly reduced.

The chapter begins with a review of the methodology used in these analyses. Results of the analyses are then presented, beginning with a description of the levels of funding that sample districts and schools received from various sources, and following with a discussion of analyses comparing supplemental and total funding in treatment and control schools. Further analyses examine patterns of spending within paired treatment and control schools in order to examine possible differences in program focus.

A. METHODOLOGY

1. DATA COLLECTION

A questionnaire administered to district business managers requested information for school years 1973-74 (estimated) and 1972-73 (actual) on amount and spending patterns of compensatory funds; these funds were to include not only ESAA, but also Title I, Title III, Title IV, ESAP, and special state funding. At the district level, information was requested on average daily attendance (ADA), available amounts of compensatory or remedial funding, and average per-pupil expenditure excluding remedial or compensatory funding. Descriptive data on grade enrollment, on amount and source of compensatory funding, and on allocation pattern of funding by grade and by source were obtained from the district for each sample school. Follow-up telephone calls to the business managers made it possible to obtain a 90% response to the questionnaires.

---

*It should be noted that, by law, neither SDC nor USOE could direct districts to allocate non-ESAA funds in accordance with this assumption. Control of other federal program funds, such as ESEA Title I, was still at the discretion of the district, provided that the requirements of those other programs were met.

The following definitions were used for the funding analysis:

- Regular expenditures--A school incurs these expenditures in the course of running its regular school program, normally supported by state and/or local funds. In most districts, the official district position, sometimes reflecting state regulations, is that regular per-pupil expenditures are constant across schools in the district. This was accepted as a working assumption for purposes of the present analyses, although there is informal evidence that some districts deviate from this pattern in their actual expenditures.*

- Supplemental expenditures--A school incurs these expenditures when it supplies remedial or compensatory services to low-achieving or disadvantaged children. Consequently, these are costs over and above regular expenditures and are financed primarily by state or federal funds, including ESAA.

- Total expenditures--Total expenditures are the sum of regular and supplemental expenditures.

2. COMPUTATION OF PER-PUPIL EXPENDITURES

Because of wide variability in district size, it was important to utilize per-pupil rather than total expenditures. The calculation method employed is described below.

a. Regular Per-Pupil Expenditures

Regular expenditures were reported directly in the questionnaire under the heading of "per-pupil expenditures" and were calculated by dividing the district's current expense for education by the average daily attendance (ADA).

---

*A possibly extreme example of these within-district variations is a recent study of a large metropolitan school district, which indicated that the regular per-pupil base varied from $492 to $993 across schools in the district. To obtain completely realistic data on individual school costs, it may be necessary to work "within the system," as was done in the study above; such an approach would be excessively time-consuming and expensive for a national sample such as that in ESAA evaluation. Nevertheless, the point should be clear that all cost data in this report are at best an approximation of actual dollar allocations.

b. Supplemental Per-Pupil Expenditures

At the district level, the problem was how to estimate per-pupil supplemental expenditures when no information was available on which programs (other than ESAA) were being applied to specific students. After reviewing a number of alternative procedures, it was decided to use the best available proxy for the number of low-achieving or disadvantaged children in the district. Information had been obtained on the estimated percentage of children meeting Title I requirements;* this figure was selected and applied to the ADA** to arrive at a single estimate. The assumption here is that all remedial funds were applied to the same children. Consequently, per-pupil expenditures will be overestimated (or underestimated) if Title I requirements were less (or more) restrictive than those of other funds.*** However, since information obtained informally from business managers indicated that approximately 70% of the pupils receiving compensatory assistance got assistance from multiple funding sources, the assumption used here in calculating per-pupil expenditures may be an acceptable approximation.

At the school level, information was obtained on the number of participants in each compensatory program, but again not on the extent of overlap among students served by the funds. The use of the average per-pupil grant size was rejected as a possible solution, as it was known that overlap exists in the students served by the different grants. This method could also produce estimates larger than the actual school enrollment. Therefore, it was decided to use the total school enrollment as the divisor to obtain per-pupil estimates. This approach seemed more justifiable at the school level than at the district level, since the sample schools typically had large proportions of students in compensatory programs, whereas many districts contained schools with large proportions of non-participating students. In particular, the division of total supplemental funds by total school enrollment appears quite reasonable for programs such as Title I and certain special state funds, since the sample schools usually listed the entire student body as participants in those programs. The procedure will tend to underestimate per-pupil supplemental expenditures in the case of programs having smaller numbers of participants, but the degree of underestimation should be similar for the matched pair of treatment and control schools that were used in the most important analyses. Since those paired schools were matched on socioeconomic status, prior achievement, and racial composition, it was reasonable to expect that they would have similar numbers of disadvantaged students. In short, for the analyses reported here, the actual per-pupil dollar amounts cannot be considered precise, but the relative treatment-control differences in funding should be meaningful.

---

*Source was the District Superintendent Questionnaire B, Question 15. The value used was a weighted average of the percentage of the total enrollment meeting Title I requirements at the elementary and secondary levels in the district; the weights were the district enrollment at the respective levels.

**Of the districts in the sample, 63% reported that 30% or less of the total district enrollment met Title I requirements. (However, most sample schools within those districts reported most or all of their students to be participating in Title I.)

***A potential source of error is in the use of the estimated proportion itself. As a multiplicative factor, its error rate influences several other computations.

Clearly, the procedure described is only one of many different estimation models that could be used. In the absence of precise information about which specific students received what aid from which funding sources, any method of calculating per-pupil supplemental expenditures is potentially subject to sizable errors of estimation. Although the averaging procedures used for the first-year data were felt to be as good as any available, a continuing exploration of other methods will be conducted for future reports.

c. Total Per-Pupil Expenditures

Total per-pupil expenditures were obtained by simply summing regular and supplemental per-pupil expenditures.

3. STANDARDIZATION

In examining funding allocations, it was important to obtain standardized dollar figures that were adjusted for local and regional differences in cost of living, so as to maximize comparability of data across districts. A consumer price index is published by the U.S. Department of Commerce* for 23 Standard Metropolitan Statistical Areas (SMSAs), but the most recent index data available were for 1972. Further, the index applied only to SMSAs and did not include all the states in the sample or the small cities in the study. Therefore, a new index was constructed by dividing a particular district's minimum teacher salary by the average minimum salary within the sample. This approach reflected variations between cities in the same state, and was based on the single largest resource expenditure of most sample schools. (Staff salaries represent approximately three-fourths of the total supplemental expenditures in reading and math.) The price indexes thus constructed ranged from .80 to 1.29. This reflected considerable variability in salaries, with beginning teachers in some districts earning more than half again as much as teachers in lower-paying districts. Adjustments based on the price indexes should therefore have helped to reduce spurious variability in the expenditure data due to cost-of-living and other local pricing factors.

B. RESULTS

The purpose of this section is to describe the general financial setting in which the sample schools operate. Results reported at the district level include standardized total, regular, and supplemental per-pupil expenditures.

---

*Bureau of Census, Statistical Abstract, 1972.

a. Total, Regular, and Supplemental Per-Pupil Expenditures

Standardized total per-pupil expenditures in the sample districts ranged from $601 to $2,927 for the regular school year, with an average expenditure of $1,343. Table V-1 illustrates this variation, showing that a majority of districts (51%) spent less than $1,200 a year, but it was not uncommon to have expenditures higher than $1,800. The mean value of standardized regular per-pupil expenditures across all districts in the ESAA evaluation sample was $882, and 62% of the districts spent less than $900 per student.

TABLE V-1. STANDARDIZED TOTAL AND SUPPLEMENTAL PER-PUPIL EXPENDITURES FOR SAMPLE DISTRICTS, 1973-74

Total Per-Pupil Expenditures	Frequency	Percentage Total
$ 600-$ 900	8	11
$ 901-$1,200	29	40
$1,201-$1,500	14	19
$1,501-$1,800	9	13
$1,800+	12	17
TOTAL	72	100

Statistics: Range = $601-$2,927
Mean = $1,343
Standard Deviation = $494

Supplemental Per-Pupil Expenditures	Frequency	Percentage Total
Under $100	1	1
$100-$300	29	40
$301-$500	22	31
$501-$700	10	14
$701-$900	1	1
Over $900	9	13

Statistics: Range = $75-$1,986
Mean = $460
Standard Deviation = $360

Standardized supplemental per-pupil expenditure--that is, funds from all sources other than regular district sources--ranged from $75 to $1,986, with a mean of $460 (see Table V-1). Seventy-two percent of the districts spent less than $500 per pupil in supplementary monies.

b. Regional Variation in Per-Pupil Expenditures

As shown in Table V-2, most of the districts in the ESAA evaluation sample were in Regions IV (Southeast) and VI (South Central), the regions containing the most ESAA awardees. Regions II (Metropolitan Northeast), V (North Midwest), and VII (Central Midwest) appeared to have relatively higher total expenditures per pupil; this may have been because those regions had the smallest proportions of students meeting Title I requirements (which suggests that the students were of higher SES) and also because they had large proportions of schools in urban areas, which typically have higher expenditures than rural areas. Table V-2 also shows how the regular per-pupil expenditures were distributed across the HEW regions. Regions IV and VI, which contained more than 50% of the sample districts, again showed a concentration in the lower end of the expenditures scale; the Metropolitan Northeast, with seven districts, had the highest per-capita expenditure. The regional variation in supplemental funding followed the same general pattern as that for regular expenditures.

2. SCHOOL-LEVEL FUNDING: DESCRIPTIVE ANALYSES

Paralleling the district-level descriptions, a series of analyses was performed on the funding characteristics of the schools in each of the three evaluation samples. The results of these analyses are contained in Tables V-3 through V-5. A summary of the total per-pupil expenditures in standardized dollars is presented in Table V-3. It is immediately apparent that the Pilot elementary schools had the highest total per-pupil expenditure, with Basic elementary and Basic secondary schools expending smaller amounts. It should be noted that the inter-quartile ranges of the three distributions are very similar, indicating a fair degree of overlap.

When these school distributions are compared with the one reported in Table V-1 for the districts, it is apparent that the sample schools had lower per-pupil expenditures than the districts from which they were drawn. This does not mean that the sample schools had lower funding levels than other schools in the sample districts, but simply reflects the fact that administrative costs contained in the district calculations were not included in the school-level calculations.

Table V-4 shows the per-pupil supplemental funding in standardized dollars. Again, the means and entire distributions were lower than the district counterpart reported in Table V-1. Also, it is clear that the Pilot schools expended more supplemental funds than the Basic elementary or Basic secondary schools. Noticeable is the large difference in supplemental funding between the elementary and secondary levels, with the Basic secondary funding level averaging less than a third of either of the elementary funding levels. However, it should be noted that the secondary schools usually reported much larger numbers of student participants; with a larger denominator used in calculating the per-pupil expenditures, the resulting estimates, almost by definition, had to be smaller than those at the elementary level.

A series of analyses, based on only the treatment schools, was conducted to determine the nature and magnitude of ESAA funding. Table V-5 presents a descriptive summary of ESAA funding for all the treatment schools within each of the three evaluation samples. The Pilot schools, on the average, expended

TABLE V-2. REGIONAL VARIATION IN STANDARDIZED TOTAL AND REGULAR PER-PUPIL EXPENDITURE, 1973-74

HEW Region	Number of Districts in Sample	Percentage of Total Enrollment Meeting Title I Requirements	Type of Expenditure	PER-PUPIL EXPENDITURES					MEAN $
				$600-900	$901-1200	$1201-1500	$1500-1800	$1800+	
II Metropolitan Northeast	7	20	Regular	-	2	4	-	1	1368
			Total	-	-	1	1	5	2050
III Mid-Atlantic	6	31	Regular	4	2	-	-	-	814
			Total	1	1	3	1	-	1216
IV Southeast	22	38	Regular	18	3	1	-	-	742
			Total	6	12	1	3	-	1065
V North Midwest	6	14	Regular	1	4	1			1038
			Total	-	1	-	2	3	1895
VI South Central	21	44	Regular	17	4				804
			Total	1	12	5	-	3	1233
VII Central Midwest	2	10	Regular	-	2	-	-	-	1125
			Total	-	-	-	2	-	1786
IX Pacific Southwest	5	28	Regular	3	2	-	-	-	859
			Total	-	2	2	-	1	1365
X Pacific Northwest	3	24	Regular	1	2	-	-	-	1010
			Total	-	1	2	-	-	1308
TOTAL:	72*	24	Regular	44	21	6	-	1	882
			Total	8	29	14	9	12	1343

*District sample response rate = 90%.

TABLE V-3. STANDARDIZED TOTAL PER-PUPIL EXPENDITURES (ALL SAMPLE SCHOOLS), 1973-74

Total Per-Pupil Expenditures	Pilot		Basic Elementary		Basic Secondary	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$ 600-$ 900	20	33	27	37	21	62
$ 901-$1200	29	48	34	46	12	35
$1201-$1500	10	16	10	14	1	3
$1501-$1800	0	0	2	3	0	0
$1800+	2	3	0	0	0	0
Total	61	100	73	100	34	100
Mean	$1031.15		$933.59		$878.70	
Interquartile Range	$808-$1186		$839-$1141		$800-$1000	
Standard Deviation	$289.33		$223.21		$169.99	

TABLE V-4. STANDARDIZED TOTAL PER-PUPIL SUPPLEMENTAL EXPENDITURES (ALL SAMPLE SCHOOLS), 1973-74

Total Per-Pupil Supplemental	Pilot		Basic Elementary		Basic Secondary	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
< $100	13	21	35*	48	31**	91
$100-$200	26	43	27	37	3	9
$201-$300	9	15	6	8	0	0
$301-$400	6	10	3	4	0	0
$400+	7	11	2	3	0	0
Total	61	100	73	100	34	100
Mean	$237.71		$119.62		$31.64	
Interquartile Range	$109-$233		$49-$148		$0-$43	
Standard Deviation	$232.97		$108.46		$38.05	

*Seven schools reported zero supplemental funding.

**Nine schools reported zero supplemental funding.

TABLE V-5. STANDARDIZED ESAA PER-PUPIL* EXPENDITURES (ALL TREATMENT SCHOOLS), 1973-74

Total Per-Pupil ESAA Expenditures	Pilot		Basic Elementary		Basic Secondary	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
< $100	9	23	15	41	13**	68
$100-$200	11	28	14	38	6	32
$201-$300	8	21	2	5	--	--
$301-$400	6	15	1	3	--	--
$400+	5	13	5	13	--	--
Total	39	100	37	100	19	100
Mean	$231.64		$174.10		$59.96	
Interquartile Range	$103-$332		$49-$166		$13-$104	
Standard Deviation	$192.21		$217.26		$61.57	

*The per-pupil figure for this table, unlike that for Table V-4, was calculated on the basis of the actual number of ESAA participants as reported in the Business Manager's Questionnaire.

**Includes one treatment school with zero ESAA funding.

more ESAA money than did either of the other two groups. ESAA per-pupil expenditures were far lower at the secondary level than in elementary schools, again reflecting primarily the larger number of participating students reported at the secondary level. It may be noted in Table V-5 that one school reported zero ESAA funding despite the fact, verified by a telephone call to the district, that the school in question was designated as a treatment school. The cause of this inconsistency has not yet been determined.

Another question of considerable interest relates to the use made by treatment schools of the ESAA money. Was it distributed for distinctly different applications than other supplemental funds, or treated more as part of a single supplemental pool? Data pertinent to this question are presented in Table V-6, which shows the division of money into reading, mathematics, and "other" activities. Expenditures in the "other" category consist of the sum of the expenditures for counseling and guidance services, new curriculum development, intercultural relations programs, career education, community activities, administrative costs, and health services.

The data presented in Table V-6 indicate that, at the elementary level, a larger percentage of ESAA money than of non-ESAA supplemental money was focused on the "other" category, while the non-ESAA funding was more heavily concentrated on reading. Little supplemental money seems to have been targeted to the mathematics area. At the secondary level, by contrast, a greater percentage of ESAA money than of non-ESAA supplemental money was spent in the reading area. Once again, little ESAA money was spent on mathematics, while roughly comparable percentages of ESAA and non-ESAA funds were expended in the "other" category.

A final series of analyses also examined the allocation of ESAA funds to treatment schools; these analyses focused on the relationships* between number of ESAA dollars awarded and characteristics of the school. No significant associations were found between the amount of ESAA funding and the regular district-based funding or between ESAA funding and non-ESAA supplemental funding. At the secondary level, poorer schools tended to receive larger amounts of ESAA funding, indicating that these funds helped to ameliorate funding differences between treatment schools. The amounts of ESAA funds were insignificantly but positively related to other supplemental funds received by treatment schools.

Correlations between ESAA funding and initial levels of achievement indicate that, at the secondary level, schools with the greatest academic need (as indicated by the depressed levels of initial achievement in reading and math) received the largest amount of support (statistically significant at $p < .05$). Relationships for Pilot and Basic elementary programs were non-significant.

The relationships between ESAA funding and school demographic characteristics again indicate interesting patterns at the secondary level, but non-significant results at the elementary level. High schools with low socioeconomic levels received significantly higher levels of ESAA funding. There was a tendency for schools with larger percentages of minority students to receive higher

---

*Correlational analyses were used for the results reported here.

TABLE V-6. PERCENTAGES OF ESAA AND NON-ESAA SUPPLEMENTAL FUNDS SPENT ON READING, MATH, AND "OTHER" ACTIVITIES IN TREATMENT SCHOOLS

Focus	Pilot*		Basic Elementary**		Basic Secondary***	
	Percentage of ESAA $	Percentage of Non-ESAA $	Percentage of ESAA $	Percentage of Non-ESAA $	Percentage of ESAA $	Percentage of Non-ESAA $
Reading Activities	49	77	55	71	35	21
Math Activities	16	15	19	11	19	36
"Other" Activities	35	8	26	18	46	43

*Excludes one treatment school with zero non-ESAA funding.

**Excludes six treatment schools with zero non-ESAA funding.

***Excludes one treatment school with zero ESAA funding and six treatment schools with zero non-ESAA funding.

levels of funding, but this relationship was not statistically significant. All elementary-level relationships were near zero, with the exception of a low positive relationship between Pilot ESAA funds and the socioeconomic levels in those schools.

Certain conclusions can be drawn from the above discussion of school-level funding. First, local Pilot programs reportedly focused approximately two-thirds of their funds on activities directly related to the improvement of basic skills, and the remaining third on supportive activities such as individual and group guidance and counseling of students, new curriculum development, community activities, and administrative costs. Further exploration will be performed in subsequent evaluation years to determine the degree of relevance of those supportive activities to skills improvement. In Basic elementary and secondary schools there appears to have been a reasonable allocation of funds across the three major application areas (reading, mathematics, and supportive activities including desegregation-related activities), in light of the fact that Basic programs, under the Act, are intended to pursue desegregation-related goals as well as basic skills improvement.

The second major conclusion from the school-level funding analyses relates to the allocation patterns for ESAA and other supplemental funds. It seems clear that at least some of the ESAA money was distributed by treatment schools in a substantially different pattern than were non-ESAA supplemental funds.

3. FUNDING ANALYSES OF TREATMENT-CONTROL PAIRS

Because of the special interest in comparing funding levels and expenditure patterns in treatment and control schools, additional school-level analyses were restricted to a subset of sample schools consisting of treatment and control schools in matched pairs. The subsample included 17 Pilot elementary school pairs, 33 Basic elementary pairs, and 12 Basic secondary pairs.

a. Frequency Distributions of Funding

Since regular per-pupil funds were assumed to be constant across schools in a district, treatment-control differences in supplemental funding were equivalent to differences in total funding. The variable employed in the school-level analyses was the per-pupil supplemental funding; i.e., the total supplemental funds were divided by the total number of students enrolled in the school. The per-pupil expenditure was utilized in an effort to reduce the effect of any difference in size between the control and treatment schools.

In Table V-7 the frequency and percentage distribution, mean, interquartile range, and standard deviation of total per-pupil expenditures are shown for the treatment and control schools in each program. The results indicate that the treatment schools received, on the average, from $29 (Pilot elementary) to $43 (Basic elementary) more total per-pupil funding than the control schools.

TABLE V-7. STANDARDIZED TOTAL PER-PUPIL EXPENDITURES FOR SCHOOLS IN TREATMENT-CONTROL PAIRS, 1973-1974

Range Per-Pupil Expenditures	Treatment/ Control	Pilot		Basic Elementary		Basic Secondary	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$ 600-$ 900	Treatment	6	35	10	30	4	33
	Control	7	41	12	36	7	58
$ 901-$1200	Treatment	7	41	14	42	7	58
	Control	4	24	13	39	4	33
$1201-$1500	Treatment	3	18	6	18	1	9
	Control	4	24	5	15	1	9
$1501-$1800	Treatment	-	-	2	6	-	-
	Control	2	11	2	6	-	-
$1800+	Treatment	1	6	1	4	-	-
	Control	-	-	1	4	-	-
Total	Treatment	17	100	33	100	12	100
	Control	17	100	33	100	12	100
Mean	Treatment	$1059.98		$1078.23		$944.12	
	Control	$1031.37		$1035.38		$907.50	
Interquartile Range	Treatment	$834-$1125		$817-$1201		$779-$1041	
	Control	$842-$1293		$780-$1142		$771-$1019	
Standard Deviation	Treatment	$364.68		$325.41		$189.14	
	Control	$311.07		$333.12		$187.86	

Table V-8 presents the same type of information for per-pupil supplemental funding. The results here mirror the pattern found in the previous table, since regular district funds were assumed to be a constant for treatment-control pairs. It is immediately apparent that Pilot schools, whether treatment or control, received more per-pupil supplemental funding than Basic schools. Of further note is the low level of funding for the secondary schools where, because of larger reported numbers of participating students, the per-student figures were less than a third as large as those for treatment pupils in the elementary samples.

b. Treatment-Control Funding Breakdowns by Region

Analyses were performed to determine geographic breakdowns of the total and total supplemental funding levels for treatment and control schools. As expected on the basis of using matched pairs of schools, there was little difference between the treatment and control schools' mean funding levels within a geographic region. Differences across regions reflected the pattern previously discussed at the district level.

c. Comparative Funding in Treatment and Control Pairs

Matched-pair t-ratios were calculated to determine whether the funding differences in treatment and control schools were statistically significant. The statistics were computed for total supplemental per-pupil funding and for non-ESAA supplemental funding. Each of these was further broken down into the component funding areas of reading, mathematics, and "other," with separate analyses being conducted for staff and non-staff expenditures.

For the Pilot sample, no statistically significant treatment-control differences were found in any area of total supplemental dollars. This finding was at least partially explained by the analyses of non-ESAA funding. The control group had higher non-ESAA supplementary expenditures than the treatment group in every funding category except non-staff expenditures in reading. While the differences were not statistically significant, they had the effect of reducing the treatment-control differences in total supplementary per-pupil allocations to a non-significant level.

In the Basic elementary sample, the treatment group has significantly higher total per-pupil funding except in the "other" category. No significant differences existed between the two groups in non-ESAA supplemental funding.

In the Basic secondary sample there were significant treatment-control differences (favoring the treatment group) in three areas: reading expenditures, total supplemental expenditures, and "other expenditures." There were no significant treatment-control differences in non-ESAA supplemental allocations.

An additional analysis was conducted in an attempt to gain more insight into the magnitude of the treatment-control differences in total supplemental funding. Table V-9 presents the results of this analysis. A frequency distribution of the percentage differences in funding between the treatment and control school pairs is presented for each evaluation sample. The percentage estimate for each treatment-control pair was determined by computing the difference between

TABLE V-8. STANDARDIZED PER-PUPIL TOTAL SUPPLEMENTAL EXPENDITURES FOR SCHOOLS IN TREATMENT-CONTROL PAIRS, 1973-1974

Range Per-Pupil Expenditures	Treatment/ Control	Pilot		Basic Elementary		Basic Secondary	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Under $100	Treatment	4	24	11	33	10**	83
	Control	7	41	19*	58	12**	100
$100-$200	Treatment	7	41	17	52	2	17
	Control	6	35	8	24	--	--
$201-$300	Treatment	2	12	2	6	--	--
	Control	1	6	4	12	--	--
$301-$400	Treatment	3	18	2	6	--	--
	Control	-	--	1	3	--	--
Over $400	Treatment	1	5	1	3	--	--
	Control	3	18	1	3	--	--
Total	Treatment	17	100	33	100	12	100
	Control	17	100	33	100	12	100
Mean	Treatment	$228.85		$145.18		$47.66	
	Control	$200.24		$102.34		$11.04	
Interquartile Range	Treatment	$113-$233		$71-$158		$12-$80	
	Control	$69-$196		$22-$127		$0-$18	
Standard Deviation	Treatment	$230.33		$117.86		$44.09	
	Control	$217.62		$103.28		$19.68	

*Includes seven control schools with zero supplemental funding.

**Includes one treatment and eight control schools with zero supplemental funding.

TABLE V-9. FREQUENCY DISTRIBUTION OF PERCENTAGE DIFFERENCES IN TOTAL SUPPLEMENTAL FUNDING FOR TREATMENT-CONTROL PAIRS

Percentage Difference*	Pilot		Basic Elementary		Basic Secondary	
	Frequency (N=17)	Percentage	Frequency (N=35)	Percentage	Frequency (N=15)	Percentage
Below -.45	0	0.0	0	0.0	0	0.0
-.36 to -.45	1	5.9	0	0.0	0	0.0
-.26 to -.35	0	0.0	0	0.0	0	0.0
-.16 to -.25	0	0.0	0	0.0	0	0.0
-.06 to -.15	3	17.7	1	3.0	0	0.0
-.05 to -.15	8	46.9	20	60.6	9	75.0
.06 to .15	2	11.8	9	27.2	2	16.9
.16 to .25	1	5.9	3	9.2	1	8.1
.26 to .35	1	5.9	0	0.0	0	0.0
.36 to .45	1	5.9	0	0.0	0	0.0
Abo[illegible] .45	0	0.0	0	0.0	0	0.0

*A minus sign indicates that the treatment school had a lower funding level than the corresponding control school.

per-pupil supplemental funding for the two schools, and dividing that difference by the total per-pupil funding of the control school.

As can be seen in the table, over 46% of the Pilot sample pairs, 61% of the Basic elementary pairs, and 75% of the Basic secondary pairs were within 5% of zero difference. Furthermore, some of the differences actually favored the control schools. Differences of larger than 5% in favor of the treatment school were found in only 30% of the Pilot pairs, 36% of the Basic elementary pairs, and 25% of the Basic secondary pairs.

In summary, only in the Basic samples did treatment schools exceed controls in total supplemental funding to a degree that was statistically significant. Should the funding differences for either the Pilot or Basic samples be considered educationally meaningful? Unfortunately, this question is largely judgmental, and therefore cannot be resolved in any unequivocal manner. The largest mean difference occurred in the Basic elementary sample for total supplemental funding; here the treatment schools spent on the average $46 more per pupil than did the control schools. This amount could buy several more textbooks for each student, but could not cover the cost of a full-time aide for the class. Readers must decide for themselves whether it is reasonable to expect such an incremental expenditure to produce significant differences in student outcomes.

If previous studies are any indication, the ways in which the funds are applied may be at least as important as the absolute amount of the dollar differential. The results of the comparative analyses discussed earlier are germane to the question of program focus; they examined the treatment-control funding differences for various application areas within reading, mathematics, and "other" activities. Within the Basic elementary sample, there were statistically significant differences favoring treatment schools in total per-pupil supplementary funding for all areas of reading and mathematics; in the Basic secondary sample, the differences were significant for all reading areas and for "other" activities. These analyses give some indication of relative funding emphasis, but a clearer picture may be obtained by examining the *percentages* of total supplementary funds spent on different areas by treatment and control schools. This topic is discussed in the following section.

4. ALLOCATIONS OF SUPPLEMENTAL FUNDING WITHIN SCHOOL PROGRAMS

Considering first the overall allocation of supplemental funds to reading, math, and other activities, there were relatively small differences in the focus of treatment and control school programs at the elementary level, but somewhat greater differences at the secondary level. Table V-10 presents the percentage allocations to each of these areas of focus for the total supplemental money in the paired treatment and control schools. Of particular interest are the percentages focused on reading and mathematics activities, since these are activities presumably closely related to outcome measures used during the first year. Within the *Pilot* sample, control schools tended to spend a slightly larger part of their supplemental money on reading activities than did their treatment counterparts. Neither treatment nor control schools spent much of the supplemental money on mathematics activities.

For *Basic elementary* schools, a relatively high percentage of supplemental funds was expended for reading activities, and smaller amounts were focused on

TABLE V-10. PERCENTAGES OF TOTAL SUPPLEMENTAL MONEY SPENT ON READING, MATH, AND "OTHER" ACTIVITIES*

Focus	Pilot		Basic Elementary		Basic Secondary	
	Treatment Percentages	Control Percentages	Treatment Percentages	Control Percentages	Treatment Percentages	Control Percentages
Reading Activities	58	62	55	54	37	20
Math Activities	13	15	18	14	33	27
Other Activities	27	23	27	32	30	53

*Data represented here are from treatment-control pairs only.

mathematics. Here the only differential allocation slightly favored the treatment schools in the mathematics area. Again, the difference was small and would probably not lead one to infer a meaningful difference in program focus.

Basic secondary schools had quite a different pattern of allocation, with "other" activities receiving approximately the same funding emphasis as the academic areas. Treatment schools placed more focus on reading than did the control schools, whereas the control schools emphasized "other" activities more heavily.

5. SUMMARY

- Sample Pilot schools allocated approximately two-thirds of their funds for activities directly related to basic skills improvement, and the other third for supportive activities such as counseling and guidance, curriculum development, associated administrative costs, and community activities.

- Basic elementary and Basic secondary schools appear to have allocated their ESAA funds in accordance with legislated program goals, since for the Basic program the legislation includes desegregation-related objectives as well as improvement in basic skills. Local programs, on the average, committed sizable portions of their ESAA funds to activities addressing each of those major objectives.

- There were significant treatment-control differences in total supplemental funding for two of the three samples. In the Basic elementary sample, treatment schools had significantly larger total per-pupil expenditures than their paired control schools; these differences were produced by greater treatment-group expenditures in reading and math activities. However, the differences in total funding exceeded 5% in only 36% of the pairs. In the Basic secondary sample, treatment schools again had significantly larger total per-pupil expenditures, because of higher allocations in reading and "other" activities. In only 26% of the pairs was this funding difference greater than 5%. There were no significant treatment-control differences in total per-pupi funding across the Pilot sample.

- For all sample districts (Basic and Pilot combined), the average total per-pupil expenditure (standardized across districts) was $1,343. The average total supplemental per-pupil expenditure was $460.

- The average total per-pupil expenditure for all sample Pilot schools was $1,03 The Basic elementary sample had a mean value of $994 and the Basic secondary sample an average of $879. The per-pupil supplemental expenditures varied from $238 for Pilot schools to $120 for Basic elementary schools and $32 for Basic secondary schools.

- In Pilot treatment schools, the average ESAA expenditure was $232. In Basic elementary schools it was $174, while the Basic secondary sample had an average ESAA expenditure of $60 per pupil.

- The relative percentages of total per-pupil supplemental money allocated to reading, mathematics, and "other" activities were quite similar for treatment and control schools at the elementary level. At the secondary level, treatment schools spent a larger percentage than control schools on reading, and a smaller percentage than controls on "other" activities.

CHAPTER VI

RESOURCE ALLOCATIONS: SERVICES

This chapter examines the translation of program dollars into the provision of services to sample students in Pilot and Basic sample schools. It describes those services with particular emphasis on activities related to ESAA objectives and addresses questions such as the following: What kinds of facilities, staff, and materials were used in providing services to sample students? What were the characteristics of the reading and math instructional programs? Of intercultural programs? Finally, how were identified student academic needs correlated with the receipt of services in ESAA programs?

The data reported in this chapter are necessarily limited in scope and depth. They were gathered by means of questionnaires, which cannot provide detailed information on the quality of the instructional interactions, or on the tone or climate of the classroom and school environment. Moreover, the school program descriptions reported here are based on responses by school staff members and administrators, and may not fully or precisely reflect actual occurrences in the classrooms and schools. The picture presented in this chapter, using data from the program questionnaires, will at a later date be supplemented by a document describing the results of in-depth, on-site observations of a subset of the sample sites.

One goal of the ESAA program, particularly in Pilot projects, was to provide compensatory education to students with identified academic deficiencies stemming from segregation and minority isolation. But ESAA is rarely the only compensatory program in the school; often, an ESAA-participating school also provides compensatory education funded under ESEA Title I and other Federal or state programs. These services are frequently extremely similar in nature, regardless of the funding source, and school staff members are often unable to specify exactly what activities are supported by what programs. Thus, any meaningful picture of the compensatory learning environment of students in the sample schools--controls as well as treatment schools--must include data on the full array of compensatory activities in those schools. This section of the report is intended to provide such data. In virtually all instances, the instruments used to collect these data were administered in control and treatment schools, and did not specifically distinguish ESAA-funded compensatory activities from non-ESAA activities.

The first section of this chapter describes the physical, staff, and material resources characterizing the students' school environment in sample programs. The next section provides a description of instructional programs, including such characteristics as program exposure, instructional objectives and approaches, classroom grouping characteristics, and lesson structure. Descriptive profiles are provided for sample Pilot and Basic programs in regular and remedial reading, regular and remedial math, and intercultural programs. The final portion of the chapter concerns the issue of whether ESAA services were appropriately targeted towards the needs of students identified as having specific academic deficiencies.

Tables in this chapter display distributions for treatment and control schools in matched pairs as well as distributions for unpaired treatment schools. In general, the correlated t-test was used to test for treatment-control differences at the school level.

A. RESOURCES AVAILABLE IN SAMPLE SCHOOLS

1. PHYSICAL RESOURCES

Physical resources provided for sample students were examined in terms of the availability of central and specialized facilities as reported by school principals. Central facilities, as defined here, included centralized libraries; auditoriums; cafeterias; gymnasiums; rooms housing various combinations of cafeterias, gymnasiums, and auditoriums; kitchens; and athletic fields. Specialized facilities included resource centers such as central media centers, classroom libraries, learning laboratories, instructional materials production centers, television production studios, and teacher reference centers.

There were no significant differences between paired treatment and control schools in the availability of central or specialized facilities in Pilot and Basic sample groups. There were also no differences between Pilot and Basic elementary sample schools, but secondary schools tended to exceed both elementary samples in central and specialized facilities.

Central media centers and classroom libraries were found in the majority of both Pilot and Basic sample schools at the elementary level. About half of the Pilot and Basic elementary sample schools, moreover, reported having learning laboratories and teacher reference centers. More specialized facilities were offered at [illegible] secondary level, presumably to meet augmented student curriculum needs. For example, 76% of sample Basic secondary schools had instructional materials production centers, in comparison to 55% of the Pilot elementary schools and 64% of the Basic elementary sample schools. Central media centers, classroom libraries, and learning laboratories were also available in a majority of the Basic secondary schools.

2. STAFF RESOURCES

a. Number of Students Per Teacher

The number of students per teacher provided some indication of the distribution of staff resources among students in a school. Sample school principals were asked to estimate the average total number of students per teacher for each grade level in their schools. Overall, there were no major differences across grade levels within sample groups. The summary data showed that, within treatment-control pairs at the elementary school level, the number of students per teacher was about 30 in Pilot sample schools, 27 in Basic elementary sample schools, and 25 in Basic secondary sample schools. There were no significant treatment-control differences in overall student-teacher ratios. However, as noted in Section B of this chapter, there were some significant treatment-control differences in class size in reading and math instructional programs.

b. Teacher Education

The educational background of sample program teachers was examined in terms of the highest college degree earned. Among elementary program teachers, the most common response was the bachelor's degree. Fourteen to twenty percent of Pilot teachers and about 26% of Basic elementary teachers reported having the master's degree, reflecting slightly greater professional skills among sample Basic elementary teachers. In Basic secondary schools, teacher education was almost evenly divided between the bachelor's and master's degree levels. No significant treatment-control differences were found in any of the evaluation samples.

c. Teacher Inservice Training

Inservice training to improve the teaching of reading or math, or to help teachers work with low achievers and racially mixed groups, was treated for this evaluation as a professional staff-development component of compensatory programs. Such training is also an indicator of how funding resources were allocated in the school.

Teachers in the study sample (treatment and control) were asked to indicate the areas in which they had received inservice training within the previous 12 months from among the following: reading, math, intergroup relations, and instruction of the disadvantaged. At the elementary-school level, inservice training activity was most heavily focused on reading. In both Pilot and Basic samples, inservice training participation was highest in reading instruction, with about 50% of the teachers participating. About one-third of the sample teachers reported having taken inservice training in math and in intergroup relations. Instruction of the disadvantaged had the lowest rate of inservice training participation. There were no significant treatment-control differences in the Pilot sample, but a significantly higher proportion of teachers in Basic elementary treatment schools (52%) than in the corresponding control schools (37%) reported inservice training in reading.

Compared with sample elementary schools, sample Basic secondary schools showed less inservice training participation in general, but greater emphasis on inservice training related to intergroup relations. The proportion of secondary-level treatment school teachers (36%) who participated in this area of inservice training was significantly higher than that of control school teachers (27%). Instruction of the disadvantaged drew the next highest overall rate of inservice training participation (15%).

d. Specialized Support Personnel and Teacher Aides

Table VI-1 gives information on certain aspects of staff composition within programs. For each sample group, the table shows the percentage of total staff size accounted for by specialized support personnel (i.e., remedial reading teachers, remedial math teachers, speech therapists, and audiovisual specialists). No significant treatment-control differences were evident in the Pilot or Basic evaluation groups.

At the elementary school level, remedial reading teachers were represented most commonly among specialized support personnel, accounting on the average for 11% of the total staff in both sample Pilot schools and Basic elementary schools. Remedial math teachers, speech therapists, and audiovisual specialists each represented, on the average, 5% or less of the total staff in both Pilot and Basic programs. At the secondary school level, the representation of specialized support personnel was considerably smaller; remedial reading teachers and compensatory math teachers each accounted, on the average, for about 2% of the total staff.

The practice of having teacher aides in the classroom has become a point of interest in elementary education. In this study, teachers were asked to indicate whether aides were available in their regular and remedial reading and math classes. Overall, teacher aides for both regular and remedial programs were present more frequently in Pilot schools than in Basic schools. In Pilot regular reading programs, there was a significant difference between the percentage of treatment school teachers (61%) and control school teachers (37%) reporting one or more aides in class. Similarly, in Basic elementary regular reading programs, treatment school teachers reported the presence of teacher aides significantly more often than teachers in the paired control schools (42% compared with 25%).

In regular math programs, both Pilot and Basic, treatment school teachers reported the presence of aides significantly more often than did the control school teachers. Specifically, the percentages of treatment school teachers reporting the use of aides were 52% (Pilot) and 36% (Basic elementary), while the corresponding percentages of control school teachers were 31% and 24%.

3. MATERIALS USED IN CLASS

Regular and remedial program teachers were asked to indicate the frequency of use of various types of materials. Each instructional resource type was ranked according to frequency of use by the teacher.

Instructional resources used in reading programs were first grouped according to whether they were printed or audiovisual. Printed resources included textbooks, other books and printed materials, newspapers and magazines and other periodicals, and teacher-prepared materials. Audiovisual resources included motion pictures and/or filmstrips, slides and transparencies, tape recordings and records, video or television tapes, and games. The types of instructional resources used in math programs were basic texts, drill-and-practice materials, and audiovisual materials.

TABLE VI-1. SPECIALIZED SUPPORT STAFF COMPOSITION IN SAMPLE SCHOOLS

A. Pilot Evaluation Sample

Staff Type	Treatment Schools in T-C Pairs (N = 18)		Control Schools in T-C Pairs (N = 18)		Unpaired Treatment Schools (N = 29)	
	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Remedial Reading Teachers	10.0	9.5	11.2	9.8	12.0	8.3
Remedial Math Teachers	2.1	3.4	4.3	6.8	6.4	7.9
Speech Therapists	2.5	3.2	3.5	3.9	1.1	1.7
Audio-Visual Specialists	0	0	3.3	8.2	0	0
Number of Missing Cases	6		1		3	

B. Basic Elementary Evaluation Sample

Staff Type	Treatment Schools in T-C Pairs (N = 38)		Control Schools in T-C Pairs (N = 38)	
	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Remedial Reading Teachers	11.1	8.3	10.5	9.6
Remedial Math Teachers	4.2	7.7	1.3	4.0
Speech Therapists	4.6	4.4	4.0	5.2
Audio-Visual Specialists	1.0	2.0	1.7	4.7
Number of Missing Cases	0		0	

C. Basic Secondary Evaluation Sample

Staff Type	Treatment Schools in T-C Pairs (N = 12)		Control Schools in T-C Pairs (N = 12)	
	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Remedial Reading Teachers	2.3	1.8	2.2	2.0
Remedial Math Teachers	1.9	1.9	1.4	2.7
Speech Therapists	1.0	1.0	1.0	1.1
Audio-Visual Specialists	1.2	1.6	1.2	1.6
Number of Missing Cases	2		0	

Summary reading-resource indices were generated by averaging the ranks of the items comprising either printed or audiovisual instructional resource sets. For math programs, single-item indicators were examined for the four math instructional resource types specified above. No significant treatment-control differences were evident in the use of either reading or math materials.

In regular and remedial reading programs, the pattern across both Pilot and Basic programs showed more frequent utilization of printed than of audiovisual resources at both elementary and secondary school levels. Also of interest was a slightly greater emphasis on the use of printed materials in remedial reading than in regular reading programs.

Teachers in regular and remedial math programs indicated extensive use of all four categories of math instructional resources. In regular programs, basic texts and drill-and-practice materials were used more frequently than other materials in Pilot and Basic samples. Use of basic texts was particularly emphasized in sample Basic secondary programs. In remedial programs, on the other hand, use of materials other than basic texts and drill-and-practice materials was emphasized in Pilot and Basic programs.

4. SUMMARY OF RESULTS: FACILITIES, STAFF, AND MATERIALS RESOURCES

Key features in the availability of school and classroom resources were as follows:

- At the elementary-school level, Pilot and Basic schools were similar in overall availability of central and specialized physical facilities. In secondary schools, which typically have larger school plant sites and augmented curriculum demands, central and specialized facilities were more available.

- The number of students per teacher was slightly larger in Pilot school pairs (30:1) than in Basic elementary pairs (27:1); in Basic secondary schools, this ratio was slightly smaller (25:1).

- Education level was somewhat higher among Basic elementary school teachers than among Pilot teachers; it was highest among sample Basic secondary school teachers, as might be expected with increased professional specialization.

- At the elementary-school level, inservice training was most heavily focused on reading, with about 50% of the teachers participating. Training for instruction of the disadvantaged had the lowest rate of teacher participation (about 20%). Basic secondary schools reported less total in-service training, but relatively more emphasis on intergroup relations training than elementary schools.

- At the elementary school level, remedial reading teachers were represented to a greater degree than other specialized support personnel among total staff; at the secondary school level, remedial reading and math teachers were represented about equally.

- The presence of aides for reading and math programs was reported more frequently in Pilot schools than in Basic elementary schools.

- In regular and remedial reading programs at the elementary and secondary levels, printed resources were used more frequently than audiovisual materials. In regular math programs at the elementary and secondary levels, the use of basic texts and drill-and-practice materials was emphasized. In remedial math programs, there was fairly extensive use of materials other than basic texts, including drill-and-practice materials.

- Treatment-control differences (favoring the treatment schools) were found in only two areas: amount of in-service training and availability of teacher aides.

B. READING AND MATH INSTRUCTIONAL PROGRAM CHARACTERISTICS

This section of the chapter describes specific characteristics of the reading and math programs in the Pilot and Basic sample schools, as determined from teacher reports. To ensure comparability of data for the different samples, only Pilot and Basic schools having programs at all three grade levels of interest are included in the data summarized here.

The descriptions that follow cover all reading and math activities, whether "regular" or "remedial/compensatory." One reason for the most inclusive description is that some schools may not make clearcut operational distinctions between compensatory and non-compensatory activities, and may use the terms inconsistently. Another reason is that it is presumably the total experience in reading or math instruction that determines the student's opportunity to gain in achievement, not simply those component experiences labelled as remedial or compensatory.

1. EXTENT OF STUDENT EXPOSURE

One of the key indicators of how a school program actually operates (as distinguished from goals and guidelines, which may indicate how the program should operate) is the allocation of student time during the school day. A school administrator's statement that his program emphasizes improvement of reading skills may mean little unless students actually spend a sizable portion of their time in reading instruction. For this reason, an extensive effort was made in the evaluation to obtain data on the amounts of time spent in reading and math instruction. Results of this effort are reported in the following paragraphs.

a. Student Attendance and Exposure Log Data

The Student Attendance and Exposure Log (SAL) provided a record of the number of hours each sample student received instruction in reading, math, and intercultural activities.* The SAL data were collected on each student for one week of each month over a period of up to seven months, providing repeated estimates of the student's exposure to program activities.**

The SAL exposure categories for each individual program activity were coded to approximate an interval scale. The exposure categories were: no exposure = "0"; 1 hour = "1"; 2-3 hours = "2.5"; 4-5 hours = "4.5"; and more than 5 hours = "6." Summary indices for both reading and math exposure were computed by totalling the number of hours of instruction in each component activity of the reading section and the math section, and then averaging these total figures over the number of months of data obtained for each student.

To minimize the possible distortion introduced by respondents' under- or over-estimation of the total amount of student exposure, intensity of exposure in specific reading and math activities was defined as the proportion of time spent in each component reading or math activity, relative to the total reading and math estimates. Each proportion was averaged over the number of months of data reported for each student. The proportional exposure estimates were then aggregated to the school level for the Pilot, Basic elementary ,and Basic secondary schools.

Elements of reading exposure (comparable elements were defined for mathematics) consisted of three types of activities: (a) modes of instruction such as tutoring, group instruction, "pullout" compensatory reading instruction, and machine-mediated instruction; (b) individualized activities such as diagnostic test-taking, independent seat exercises, report writing, student presentations, and individualized reading; (c) group activities such as games and contests.

(1) SAL Exposure Results for Regular and Remedial Reading

Appendix tables A-10 to A-12 summarize the SAL exposure results for all reading activities by evaluation group. At the elementary-school level, students in paired treatment, paired control, and unpaired treatment schools in the Pilot sample received an overall average of 11.4 hours of total weekly reading exposure, and students in paired treatment and control schools in the Basic elementary sample received an average of 10.3 hours. Basic secondary sample students received an average of 8.1 hours of total weekly reading exposure.

Within the individual reading activities, elementary students in the Pilot and Basic samples spent the highest average weekly percentage of time in group instruction (about 25%), followed by independent seat exercises (about 20%) and individual reading (about 14%). Basic secondary sample students spent the highest average weekly percentage of time in group instruction (about 17%), followed by individual reading (15%), independent seat exercises (14%), report/story writing (13%), and diagnostic testing (10%).

---

*Intercultural and counseling activity exposure estimates are discussed in VI-C--Intercultural Program Exposure.

**For elementary-school students, SAL forms were completed by the teacher. At the secondary-school level, SAL forms were completed by the individual student unless he was absent, in which case the form was completed by the teacher.

Remedial reading was designated by the "pullout" compensatory reading category on the SAL; in such activities, students were pulled out of regular classes for remedial instruction.* Students in both Pilot and Basic elementary schools spent an average of 6% of total reading time in "pullout" compensatory reading. In Basic secondary schools, an average of 4% of total reading time was spent in "pullout" compensatory reading.

There were no significant treatment-control differences in total reading activity exposure. In the Pilot sample, there was a significant difference between the percentage of time spent in tutoring by an older person in paired treatment schools (8.0%) and in control schools (5.3%). While the magnitude of the difference was quite small, this could be an indication of greater availability of adult tutors, or greater utilization of adult resources, in treatment schools. In Basic elementary sample pairs, students in paired control schools spent a significantly greater percentage of time in independent seat exercises (21.3%) than did treatment-school students (19.5%).

(2) SAL Exposure Results for Regular and Remedial Math

The SAL exposure results for mathematics are summarized in Appendix tables A-13 to A-15. Average total weekly exposure was less intense in math than in reading activities. At the elementary-school level, students in Pilot schools received an average of 8.1 hours of math exposure weekly, and students in Basic schools received 8.0 hours of math exposure. Students in Basic secondary schools received an average of 5.7 hours of math exposure per week.

At the elementary-school level, in both Basic and Pilot programs, math activities were focused on group instruction and individual seat exercises, with students spending a quarter of their time in the average week in at least one of these activities.

At the high-school level, math activities were also concentrated in group instruction (25%) and independent seat exercises (21%). Allocation of time to diagnostic test-taking was higher at the secondary-school level (15%) than at the elementary-school level (8%).

Remedial math was designated by the "pullout" compensatory math activity on the SAL, and refers to situations where students were pulled out of regular math classes for remedial instruction. Students in Pilot schools averaged 5%, Basic elementary treatment students averaged 4.4%, and Basic elementary control students spent an average of 1.9% of total math time in "pullout" compensatory math. In Basic secondary schools, an average of 5% of total math time was spent in "pullout" compensatory math.

---

*Exposure to compensatory activities in the course of regular instruction was not gauged because of the schools' difficulty in distinguishing "compensatory" and "non-compensatory" activities.

There were no significant treatment-control school differences in total time of exposure to math activities for students in the Pilot and Basic evaluation groups. However, Pilot treatment students had more exposure than control students to tutoring by an older person (9.8% to 4.8%) and Pilot control students spent more time than treatment students in student presentations (5.9% to 3.4%). Basic treatment students had more exposure than control students to math "pullout" activity (4.4% to 1.9%), and Basic control students had more exposure to independent seat exercises (30.4% to 27.4%).

b. Exposure Data From Teacher Questionnaires

The teacher questionnaire provided information at the classroom level regarding student exposure in activities related to the development of specific skills in reading and math. Categories of reading activities distinguished in the teacher questionnaire included the following: matching letters or words;* learning letter names;* developing whole-word recognitions; phonic and/or structural analysis; vocabulary or learning word meanings; activities related to psycho-physical functioning, such as activities to improve reading-related conceptual abilities, to increase attention span, and to develop visual discrimination;* and auxiliary activities, including independent reading and writing.

Math activities distinguished in the teacher questionnaire included activities related to basic math concepts (math vocabulary, number concepts, symbols and rules, and verbal problem solving), and basic skills (basic computational operations and drills).

(1) Exposure Results for Regular and Remedial Reading

At the elementary-school level, teachers indicated that regular and remedial reading programs provided relatively intense exposure to word meanings, phonic and/or structural analysis, and whole-word recognitions. Relatively little exposure was given to auxiliary or psycho-physical activities or to word-attack activities (which presumably were given emphasis at elementary levels prior to the third grade). At the high-school level, the activity of greatest exposure was learning word meanings or vocabulary. No significant treatment-control differences were evident in these activities at either the elementary or secondary level.

(2) Exposure Results for Regular and Remedial Math

In Pilot and Basic elementary schools, students in both regular and remedial math classes received intense exposure to basic skills and drill activities, and less intense exposure to activities related to basic math concepts. In regular secondary-level math classes, intensity of exposure was high in both basic skills and math concepts. In high-school remedial programs, by contrast, basic skills activities were given much stronger emphasis than conceptual activities; evidently the remedial classes attempted to develop or strengthen basic skills that the students had failed to master in elementary school. There was a significantly greater emphasis on basic skills in Basic secondary treatment schools than in the paired control schools.

---

*Inapplicable at the secondary school level.

2. INSTRUCTIONAL PROGRAM OBJECTIVES

Teachers' reports of emphasis on specific instructional program objectives were used to define program focus. In reading programs, five major objective groupings (skill areas) were identified: a) comprehension skills (development of skills in using context clues, development of comprehension skills, and improvement of comprehension rate); b) word techniques (recognition of basic sight words and phonic and structural analysis of words); c) sensory-perceptual-motor skills (auditory discrimination, visual discrimination, and motor skills):* d) global skills (library and study skills and verbal communication; and e) practical skills (punctuation/paragraph skills, syllabification, and oral reading).

Math program objectives of concern related to math concepts, terminology, operations, attention span, and motivation to learn.

a. Program Focus Results for Regular and Remedial Reading

At the elementary school level, all five major objectives groupings were given considerable emphasis. In regular reading programs, in both Pilot and Basic elementary schools, the greatest emphasis was on comprehension skills and word techniques. In the Pilot sample, treatment schools placed significantly greater emphasis on word techniques than their matched controls. At the high-school level, programs focused on objectives related to comprehension and global skills; this may indicate that the students were expected to have acquired at least some skills in word techniques before they reached high school.

In elementary-level remedial reading programs, sensory-perceptual-motor skills, comprehension skills, and word techniques were employed. Slightly less emphasis was given to global skills and practice exercises. At the high-school level, remedial reading focused on comprehension skills, but also put heavier emphasis on word techniques than regular reading programs.

b. Program Focus Results for Regular and Remedial Math

A consistent pattern across Pilot and Basic programs, with little variability, indicated major emphasis on objectives related to math concepts, operations, and student motivation. This pattern was found at both the elementary and secondary levels. Terminology and attention span were given somewhat less emphasis.

---

*Inapplicable at the secondary school level.

3. INSTRUCTIONAL APPROACHES

a. Regular and Remedial Reading

Regular and remedial reading teachers were asked to indicate the major approach used in teaching reading classes from the following alternatives, relevant only to programs at the elementary-school level: linguistic-phonetic, language experience, modified alphabet, and sight method. The linguistic-phonetic approach was indicated by at least two-thirds of both regular and remedial reading teachers in Pilot and Basic programs. The next most frequent response was the language experience approach. Fewer than 10% of regular and remedial reading teachers indicated use of either the modified alphabet or sight method.

b. Regular and Remedial Math

Regular and remedial math teachers at both elementary and secondary school levels were asked to indicate whether their major approach in teaching math was "basic text," "programmed text and program materials," or "laboratory approach." In regular math programs, the most common response was the basic text approach, utilized by 59% of Pilot and 60% of Basic elementary math teachers. At the secondary level, about 80% of Basic regular math teachers responded with the basic textbook approach; the remaining responses were about equally divided between programmed and laboratory approaches.

In remedial math programs, the most common response at the elementary school level (Pilot and Basic samples) was the laboratory approach. At the secondary level, basic texts and the laboratory approach were used equally often.

In the Basic elementary program, significantly more treatment (65%) than control teachers (35%) reported use of the laboratory approach, and significantly more control (41%) than treatment teachers (13%) reported use of the basic textbook approach. This may suggest a more innovative or experimental approach on the part of treatment schools.

4. SIZE OF CLASSROOM GROUPINGS

Classes in regular reading and math instruction at the elementary level generally contained from 21 to 25 students, while classes in Basic secondary programs tended to be slightly larger (26 to 30 students). Classes in remedial instruction in reading and math were smaller (about 16 to 20 students), presumably reflecting more individualized instruction. There were significant treatment-control differences in Basic elementary remedial programs: in reading programs, the average class size in treatment schools (about 11 students) was significantly smaller than in control schools (about 18 students); in math programs, treatment school class size (about 13 students) was significantly smaller than control school class size (about 20 students).

In remedial reading and math instruction there was considerable emphasis on individualized instruction, while regular instructional programs at the elementary level emphasized adults and students in instructional groupings of between two and 10, a one-to-one relation, or pupils working independently. Secondary-level programs, by contrast, were often characterized by larger instructional groupings of more than 20.

5. DEGREE OF LESSON STRUCTURE

Degree of structure in the classroom is of interest to educators as a classroom context variable, particularly as it may interact with different student characteristics to mediate student learning. Two major indicators of structure were examined: the extent to which instruction was organized around clearcut goals and lesson plans and the extent of use of diagnostic testing to guide the instruction.

a. Organization of Instruction

Reading and math teachers were asked to characterize the degree of structure in their classes in terms of 1) use of detailed lesson plans, and 2) the extent to which instruction was based on clearly defined learning objectives. In regular and remedial instructional programs, the overwhelming majority of teachers across Pilot and Basic programs indicated the use of both lesson plans and improvisation. Most teachers also reported extensive use of clearly defined objectives. At the elementary-school level, Pilot and Basic programs had about the same overall degree of classroom structure. Secondary-level reading teachers reported slightly less structure than elementary-level teachers.

b. Diagnostic Techniques

The utilization of diagnostic techniques can be an indication of the degree of structure characterizing instructional programs in reading and math, since greater use of diagnostic techniques presumably suggests a higher degree of classroom structure. Both frequency of diagnostic testing in sample schools and extent of additional instruction provided to sample students on the basis of diagnostic testing were examined.

In general, both regular and remedial instructional programs in reading and math were characterized by moderately frequent administrations of diagnostic tests, ranging from "less than once a month" to "twice or more a week." In Pilot regular reading programs, diagnostic tests were administered more often in treatment school classes than in control school classes. By contrast, in Basic elementary remedial programs in reading and math, testing was more frequent in control school classes than in treatment school classes.

The use of diagnostic testing as a guide to further instruction was more common in remedial instruction than in regular instruction, and more frequent in math than in reading. There was little difference in this regard between Pilot and Basic instructional programs at the elementary level. High-school programs tended to rely less than elementary-level programs on diagnostic testing to guide additional instruction. In Basic elementary remedial math programs, additional instruction was based on diagnostic testing to a significantly greater extent in treatment classes than in control classes.

6. SUMMARY OF RESULTS: READING AND MATH INSTRUCTIONAL PROGRAM CHARACTERISTICS

The instructional program characteristics of Pilot and Basic sample groups are important in the evaluation as process variables that may influence learning and as variables that may reflect the utilization of ESAA funding resources. Some of the more consistent findings in the data on these instructional programs are featured below.

- Sample Pilot students received slightly greater average total weekly exposure in reading instruction (11.4 hours) than sample Basic elementary students (10.3 hours); exposure to math instructional activities was similar for sample Pilot (8.1 hours) and sample Basic elementary students (8.0 hours). At the secondary level, total weekly exposure to reading activities was 8.1 hours and exposure to math activities was 5.7 hours.

- Particular reading activities that elementary teachers emphasized in the classroom included vocabulary, and phonic and structural analysis; at the secondary level, teachers emphasized vocabulary. Activities in elementary and secondary math programs were focused on basic math concepts and on basic skills and drill activities.

- Objectives emphasized the most in regular reading programs were related to improving comprehension skills and basic word techniques; remedial reading programs focused on development of sensory-perceptual motor skills, comprehension skills, and word techniques. Regular and remedial math program objectives were focused on math concepts and operations and on motivation to learn math.

- The linguistic-phonetic approach was the major teaching approach used in regular and remedial reading programs at the elementary level. Regular math programs were characterized by the basic text approach. Use of the laboratory approach was more common in remedial math programs at the elementary level, while the major teaching approaches at the secondary level were programmed learning and laboratory.

- The sizes of regular elementary-level classes in reading and math generally ranged from 21 to 25 students; at the secondary level, classes in reading and math were slightly larger. Remedial reading and math gave greater emphasis than the regular instructional programs to individualized instruction.

- Both regular and remedial reading and math teachers reported the use of lesson plans and improvisation and the use of clearly defined learning objectives. Diagnostic tests were administered more frequently in math programs than in reading programs; reliance on diagnostic testing to guide additional instruction was more characteristic of remedial than regular instructional programs.

There were statistically significant treatment-control group differences in a few instructional program features. For example, in Pilot sample reading and math programs, a significantly higher proportion of time was spent in tutoring by an older person in treatment schools than in control schools. Also, in Basic elementary remedial reading and math programs, instructional class size was significantly smaller in treatment schools than in control schools. However, the number of significant treatment-control differences was small considering the many different combinations of dimensions on which the treatment and control groups were compared. A certain number of apparent differences could easily have been found on the basis of chance alone, given that treatment-control comparisons were made on a large number of program variables for three different sample groups (Pilot, Basic elementary, and Basic secondary), two different subject areas, several different grades, and regular and remedial instruction. Thus, despite occasional differences in the data for treatment and control schools, there is only limited evidence of any widespread or systematic pattern of differences. This finding suggests that it may be unrealistic to expect large or systematic differences in the achievement outcomes for the two experimental groups during the initial school year of the evaluation.

C. INTERCULTURAL PROGRAM EXPOSURE

Intercultural programs in sample schools were defined as activities involving inter-racial interaction and cultural enrichment activities. One of the important objectives of intercultural activities as a component of ESAA Basic programs was to facilitate desegregation in Basic schools. In addition, some Pilot schools apparently used intercultural activities to provide cultural enrichment in minority-impacted schools. Because of difficulties in defining sufficiently sensitive program descriptors relevant to these objectives, discussion of intercultural activity in this report is largely limited to a consideration of the percentage of students' time spent in intercultural programs. Intercultural program characteristics will be given increased consideration and emphasis in the second-year evaluation, drawing upon in-depth site studies and the school climate questionnaire.

Average weekly exposure estimates in non-academic activities were obtained from Student Attendance and Exposure logs in each of the following activities: intercultural activities such as interracial programs, cultural enrichment programs, and ESL (English as a second language) or bilingual activities; field trips; and "other" activities including individual and group counseling/guidance. Relative emphasis on different intercultural and "other" activities was defined in terms of the average proportion of time spent in intercultural/other activities over the number of months reported for each student. These data were then aggregated to the school level for Pilot and Basic sample schools.

Appendix Tables A-16 to A-18 present the results for the intercultural exposure data. At the elementary-school level, Pilot sample students received an average of 2.4 hours of total weekly exposure in intercultural/other activities, while Basic sample students had an average of 2.0 hours' exposure. The Basic secondary school students received an average of 2.4 hours' exposure in intercultural/other activities. Among the intercultural/other activities, both Pilot and Basic sample schools placed heaviest emphasis on cultural enrichment programs (33% and 41%, respectively). Field trips (22% of total intercultural/other exposure in Pilot schools, 16% in Basic schools) and group counseling (18% and 20%, respectively) were next in relative emphasis. At the secondary level, the major concentration was on field trips and counseling, and less emphasis was given to intercultural and interracial programs.

D. WAS THE PROVISION OF SERVICES MATCHED TO NEEDS?

Evidence was presented in Chapter IV that students in the sample schools had severe academic needs, as indicated by their depressed pretest scores in reading and math achievement tests. Furthermore, there were at least tentative indications that districts' program funding was directed toward students having academic needs, as well as toward schools with socioeconomic needs. At this point, it appears useful to assess whether ESAA dollars, specifically, were translated into services that were targeted to meet identified academic needs. To explore this question, only ESAA-funded (treatment) schools were examined.

1. OPERATIONAL DEFINITIONS

Academic need was defined by school achievement pretest subscale scores in reading vocabulary and comprehension and in math concepts and computation.*

Intercultural need was not defined at the time of pretest. Therefore, the question of whether intercultural programs met student needs was not addressed in the first year's evaluation.

Extent of services provided was defined in terms of various instructional program indicators gauging each student's experiences in the classroom. Estimates of average total weekly exposure in reading and math programs were obtained from the Student Attendance and Exposure Logs. Teachers provided data on programs at the classroom level. Summary indicators were then generated to measure emphasis on comprehension, word techniques, and vocabulary skills, as well as program emphasis on basic math concepts and basic operational skills.

For analysis purposes, both student pretest scores and instructional program focus indices were then aggregated to the school level for each grade. Only treatment schools that were in treatment-control pairs and that had complete data were considered in the analysis.

---

*Math problem solving was an additional subscale at the secondary-school level.

2. METHOD

Pearson correlation coefficients were computed between each program indicator and each pretest subscale score among treatment schools. Appropriateness of services provided was assumed to be indicated by the magnitude of negative correlation between pretest subscale scores and corresponding program intensity indices. A highly negative correlation would indicate that the receipt of services in a particular program activity (e.g., vocabulary skills training) was given to students who showed the greatest achievement deficiency in the corresponding skill area (e.g., vocabulary skills).

3. RESULTS

Tables VI-2 to VI-4 present the results of analyses of the matching of services to students' needs. Caution must be observed in interpreting these results, because of the superficial nature of the analyses reported here. Given this limitation, however, it appears that, in the sample elementary schools, services were well targeted to meet identified student needs. In Basic elementary programs there was a fairly consistent pattern, across grade levels, of significant negative correlations between average total weekly student reading exposure and school-level reading pretest achievement scores; similar negative correlations were found between math exposure and math pretest subscale scores.

TABLE VI-2. CORRELATIONS BETWEEN ACADEMIC NEEDS AND SERVICES RECEIVED IN BASIC ELEMENTARY PROGRAMS

		Pretest Subscales			
Level	Type of Service	Reading Vocabulary	Reading Comprehension	Math Concepts	Math Comprehension
Grade 3	Reading	-.34*	-.28	-.40*	-.22
	Math	-.40*	-.37*	-.38*	-.05
Total N = 32					
Grade 4	Reading	-.45*	-.39*	-.37*	-.29
	Math	-.50*	-.41*	-.37*	-.36*
Total N = 31					
Grade 5	Reading	-.39*	-.39*	-.40*	-.37*
	Math	-.25	-.25	-.27	-.31*
Total N = 31					

*Significant at the $\alpha = .05$ or above.

TABLE VI-3. CORRELATIONS BETWEEN ACADEMIC NEEDS AND SERVICES RECEIVED IN PILOT PROGRAMS

		Pretest Subscales			
Level	Type of Service	Reading Vocabulary	Reading Comprehension	Math Concepts	Math Comprehension
Grade 3	Reading	-.39	-.26	-.25	.09
	Math	-.48*	-.17	-.26	-.19
Total N = 14					
Grade 4	Reading	-.17	-.19	.14	0
	Math	-.20	-.36	-.27	-.24
Total N = 17					
Grade 5	Reading	-.15	-.24	-.19	-.36
	Math	-.16	-.14	-.12	-.41
Total N = 16					

*Significant at the α = .05 level or beyond.

TABLE IV-4. CORRELATIONS BETWEEN ACADEMIC NEEDS AND SERVICES RECEIVED IN BASIC SECONDARY PROGRAMS

		Pretest Subscales				
Level	Type of Service	Reading Vocabulary	Reading Comprehension	Math Concepts	Math Comprehension	Math Problem Solving
Grade 10						
Vocabulary	Skills	-.63*	-.61*	-.55*	-.58*	-.04
	Math	.1	.02	.02	.06	-.63*
Total N = 11						
Grade 11						
Vocabulary	Skills	-.26	-.37	-.46	-.40	-.14
	Math	-.25	-.33	-.44	-.33	-.28
Total N = 10						
Grade 12						
Vocabulary	Skills	-.58*	-.70*	-.40	-.55*	-.24
	Math	-.40	-.45	-.32	-.28	-.03
Total N = 11						

*Significant at the α = .05 level or beyond.

Since the various pretest scores were strongly intercorrelated, the data suggest that students with the greatest needs in general received greater reading and math instructional exposure in ESAA Basic progams. Similarly, in Pilot programs, although the number of cases was small, the pattern across grade levels shows average total weekly exposure in reading and math to be negatively correlated with school level pretest achievement scores.

In summary, previous chapters indicated that sample students in ESAA-funded districts and schools had acute educational needs. The present chapter presented tentative evidence that ESAA dollars were translated into services having at least a general correspondence to specific academic deficiencies as measured by the students' achievement test scores.

CHAPTER VII

BASIC PROGRAM DESEGREGATION

One of the primary activities presumably characterizing districts receiving ESAA Basic grant funds was desegregation of the school system (although in many districts this process was started well before ESAA funding). This chapter focuses on desegregation activities in the sample Basic programs; it does not consider desegregation activities in the Pilot schools, which, by definition, were minority-isolated.

The following descriptions center on the district level of operation and policy formation for desegregation plans and activities. Two primary sources of desegregation information were used: survey data from the Office of Civil Rights (OCR) and questionnaire responses from the district superintendents in the 1973-1974 ESAA evaluation sample. The Office of Civil Rights is responsible for administering Title VI of the 1964 Civil Rights Act. In compliance with this law, OCR conducts an annual survey of school systems to ascertain whether the school systems have achieved proper racial balance to the extent possible.

A merged data set containing both types of desegregation information (ESAA evaluation data and OCR data) was constructed for 46 Basic districts in the ESAA evaluation sample. This is a reasonably large sample, and fair confidence can probably be placed in data summarized across all 46 cases. However, where results are broken down by HEW region or cross-classified along two or more dimensions, the number of districts in any one cell often becomes quite small, and the results should not be interpreted too literally as representative of all other districts in that same cell.

Two additional constraints on the generalizability and meaningfulness of the data should be mentioned at this point. First, the types of desegregation-related data reported here are fairly superficial. The data tell us something about district-level policies and characterize resulting activities in overall statistical terms, but they do not provide a detailed picture of how staff and students reacted to and participated in the desegregation activities. Better and more detailed desegregation-related data should be available when the second-year report is prepared, because of the pretest and posttest administration of the newly developed School Climate Questionnaire. Furthermore, the in-depth study of 30 districts performed in the second evaluation year should help to provide greater insight, of a case-history nature, into desegregation-related policies, activities, and attitudes in the 30 sites.

A second constraint relates to the sample on which the desegregation data are based. Because of problems encountered in obtaining release of test and questionnaire data, the first-year sample did not include results from two of the largest school districts in the original evaluation sample, both located in the eastern portion of the country. One of these districts had a very high percentage of Black students and the other had the largest number of Spanish-descent students of any district in the study. These exclusions reduce the generalizability of the findings somewhat, although the sample still includes some fairly large districts from other parts of the country. It is hoped that data from the two districts concerned can be included in the results for the third-year evaluation.

A. DEFINITION OF TERMS

Before summarizing the desegregation data, it may be useful to define some of the terms used by the Office of Civil Rights (OCR) to define the status of districts and schools with respect to the nature and progress of their desegregation activities. The following discussion considers the interpretation of various OCR "compliance codes" and the derivation and meaning of the OCR desegregation index (D.I.).

In monitoring the desegregation activities in school districts, OCR assigns one of four types of compliance codes to each district. These codes are intended to indicate the present status of the desegregation efforts in each district.

Voluntary. The school system has not completely abolished its dual school-system structure, but the district office has developed its own plan for complete desegregation. Such desegregation plans have generally been drawn up in order to avoid termination of Federal funds by HEW under Title VI of the 1964 Civil Rights Act.

Court Order. The school system has accepted the terms of a final court order for desegregation and has submitted an assurance to HEW that it will abide by the regulations specified within the final court order.

Litigation. The school system does not have a final court order for desegregation and is in the process of negotiating settlement. A final court order has not been submitted to HEW.

441. The school system has achieved satisfactory desegregation and has eliminated any dual school system within the district according to regulations specified by OCR.

The government-accepted OCR district desegregation index attempts to measure the extent of desegregation in the schools within a district; the index ranges from 0.0 (a totally segregated environment) to 1.0 (a uniform racial distribution). It compares the racial balance of each school in the district with the overall racial composition of the district. Racial balance, insofar as it can be achieved with a particular district's student population, is viewed as the best situation. The farther the racial balance of each school is from the overall racial distribution of the district, the lower the index value. It should be emphasized again, however, that the D.I. is a rather gross measure that does not reflect any of the dynamic interactions within a district, nor does it reveal underlying motivations or attitudes concerning desegregation and integration.

The formula for calculating the desegregation index is as follows:

$$D.I. = \frac{\sum_{j=1}^{n} \left[\frac{a_j \times b_j}{a_j + b_j} \right]}{\frac{A_t \times B_t}{A_t + B_t}}$$

where: a_j = number of minority students in school j

b_j = number of non-minority students in school j

A_t = total number of minority students in district

B_t = total number of non-minority students in district

j = school indicator

n = number of schools in the district

B. DESEGREGATION BACKGROUND INFORMATION

Fifty percent of the Basic districts had been desegregating from one to five years. An additional 35% had been desegregating from 6 to 10 years, while 13% of the districts had been desegregating from 11 to 20 years. Only two districts in the evaluation sample began desegregation activities in 1973.

Of the 23 districts that had been desegregating from one to five years and the two that began in 1973, 65% were operating under the court-order compliance code. There were equal numbers of districts (six) operating under voluntary, court-order, and 441 compliance codes in the 6- to 10-year desegregating category. The most frequent type of compliance code for districts that had been desegregating from 11 to 20 years was the 441 (43%). From these figures on the period and type of desegregation, it appears that rather than encouraging new voluntary desegregation, ESAA money was used primarily to meet needs associated with on-going desegregation, at least in the first year of ESAA funding.

Table VII-1 illustrates the relationship between the number of years a district had been desegregating and the percentage of minority students in the district in Fall 1973. The total number of students involved in each cell is also specified (except for one district in which enrollment data were not yet available). Almost all of the districts with moderately high percentages of minority students had been desegregating from one to five years. Among districts with low percentages of minority students, by contrast, over half had been desegregating for more than five years.

The most frequent types of compliance codes for the 46 Basic evaluation districts were court order (48%), 441 (30%), and voluntary (22%). Only one district was operating under a litigation code. The percentage of minority students in the district was not related in any consistent manner to the type of compliance code assigned to the district.

TABLE VII-1. NUMBER OF YEARS DISTRICT HAD BEEN DESEGREGATING IN RELATION TO PERCENTAGE OF MINORITY STUDENTS IN DISTRICTS IN FALL 1973

Years of Desegregation Activity	Low Percentage Minority (10%-39%)	
	Number of Districts	Total Number of Students Involved
0	0	0
1-5	10	335,893
6-10	14	237,623
11-20	4	72,959

Years of Desegregation Activity	Moderate Percentage Minority (40%-69%)	
	Number of Districts	Total Number of Students Involved
0	0	0
1-5	11	684,312
6-10	1	28,830
11-20	1	21,646

Years of Desegregation Activity	High Percentage Minority (70%-100%)	
	Number of Districts	Total Number of Students Involved
0	1	6,429
1-5	2	96,748
6-10	1	4,807
11-20	1	17,320
Total Number of Districts = 46		

Court-order compliance codes were most likely to occur in the mid-Atlantic and Southeastern states. The Metropolitan Northeast and North Midwest regions were most likely to be operating under 441 codes, while the voluntary compliance codes occurred with equal frequency in the Metropolitan Northeast, Southeast, and South Central regions. Caution should be observed in attempting to generalize from these data, however, because of the small number of sample districts in some regions.

Table VII-2 shows the range of the 1973-74 district desegregation index (D.I.) values for the 46 sample Basic districts, and the total number of students enrolled in the districts having the various D.I. levels. For purposes of this discussion, D.I. values ranging from .85 to 1.0 are considered to indicate a high degree of desegregation, .55 to .84 a moderate degree, and .25 to .54 a low degree. As shown in the table, over 80% of the districts had moderate-to-high desegregation, with over half the districts (61%) in the high category at the beginning of ESAA implementation.

TABLE VII-2. RANGE OF THE 1973-1974 DISTRICT DESEGREGATION INDEX VALUES FOR THE SAMPLE BASIC DISTRICTS

1973-1974 District D.I. Value	Number of Basic Districts in Category	Percentage of Basic Districts in Category	Total Number of Students in Districts
.95-1.00 High	18	39.1	220,173
.85- .94	10	21.7	192,710
.75- .84 Moderate	4	8.7	182,028
.65- .74	5	10.9	306,857
.55- .64	2	4.3	82,504
.45- .54 Low	2	4.3	109,771
.35- .44	2	4.3	283,993
.25- .34	3	6.5	128,531
Total Number of Districts = 46			

There was a statistically significant relationship (.01 level) between the total enrollment of districts and their 1973-74 D.I. values. Districts with low enrollments had higher D.I. values than districts with moderately high and high enrollments. No significant relationship was found between the D.I. values and either the number of years the districts had been desegregating or the HEW region in which the districts were located.

Table VII-3 illustrates the relationship between the D.I. values and the district's percentage of minority students. Racially balanced districts (i.e., districts with high D.I. values) were most likely to have low percentages of minority students and small total enrollments. Moderately high-minority-percentage districts with large total-enrollment figures tended to have low or moderate D.I. values, reflecting lack of racial balance in the schools. Although there were very few cases in the high-minority-percentage category, the overall pattern suggests that schools with moderately high or high percentages of minority students had more problems associated with desegregating their school system than did schools with low percentages of minority students. Low, moderately high, and high minority-percentage districts may have faced very different problems in meeting their desegregation needs, especially as many of the high-minority-percentage districts had only recently begun to desegregate their school systems.

TABLE VII-3. RELATIONSHIP BETWEEN 1973-1974 DISTRICT D.I. VALUE AND DISTRICT'S PERCENTAGE OF MINORITY STUDENTS IN FALL 1973

1973-1974 D.I. Value	Low Percentage Minority (10%-39%)	
	Number of Districts	Total Number of Students in District
.25-.54	2	78,934
.55-.84	5	255,881
.85-1.00	21	311,660

1973-1974 D.I. Value	Moderate Percentage Minority (40%-69%)	
	Number of Districts	Total Number of Students in District
.25-.54	4	355,236
.55-.84	5	298,188
.85-1.00	4	81,364

1973-1974 D.I. VALUE	High Percentage Minority (70%-100%)	
	Number of Districts	Total Number of Students in District
.25-.54	1	88,125
.55-.84	1	17,320
.85-1.00	3	19,859
Total Number of Districts = 46		

A word of caution should be added at this point regarding sample representativeness. As noted earlier, the evaluation sample districts, though highly representative of the defined evaluation universe, included a somewhat larger proportion of large districts than the ESAA award universe. In addition, and perhaps more importantly for the present discussion, the sample Basic districts averaged significantly lower beginning-of-year D.I. values than districts in the ESAA Basic award universe; this indicates that sample districts tended to start the evaluation year with poorer racial balance across schools than the award universe. Thus, results of the desegregation analysis in sample Basic districts cannot be generalized with complete confidence to the Basic award universe.

In summary, the results indicated several significant patterns. Recency of desegregation was related to both the enrollment size of the district and the proportion of minority students within the district. Districts with large enrollment or a high percentage of minority students were likely to have been desegregating for only a few years. Sample districts with relatively good racial balance across schools (D.I. values in the range .85 to 1.0) typically had small total-enrollment figures and a low proportion of minority students.

C. SPECIFIC ELEMENTS OF DESEGREGATION PLANS

Data collected from district superintendents in the ESAA Basic evaluation sample provided descriptions of the district desegregation plans. Results reported here are based on six questionnaire items. One of the items presented a list of possible administrative procedures, and asked the superintendent to check all of the procedures being used in his/her district to achieve desegregation; among the alternatives listed were bussing, establishing schools with limited grade levels, pairing or closing schools, and drawing new school boundaries. Another item listed several procedures that might be used to assign students in elementary and secondary schools, and asked the superintendent to specify which one procedure best described the practices in his/her district; alternatives included assignment by strict geographic area, use of geographic assignments but with allowances for voluntary transfers, assignment on the basis of intelligence or achievement, free choice of assignment within district, and bussing to achieve greater racial balance. The remaining four items asked what percentages of white (Anglo) and minority elementary and secondary students attended, for desegregation purposes, a school not the school nearest to their home.

In interpreting the superintendents' responses, two constraints must be considered. First, the major data on desegregation practices are based on only two questionnaire items, and second, the sample sizes were somewhat small. Although there were 46 Basic elementary districts, the number of superintendents selecting any particular response was often much smaller. For example, only 13 superintendents of Basic districts specified bussing as the primary assignment procedure at the elementary level. This makes it difficult to draw general inferences about the characteristics of districts that used bussing for desegregation purposes.

When asked to specify all elements of their districts' desegregation plans, most superintendents (78%) selected the alternative, "Drawing new school boundaries to provide for desegregation." Another commonly designated procedure (70%) was "bussing students from other areas;" as shown in Tables VII-4 and VII-5, responses to other items indicated that larger percentages of minority students than of white students attended non-nearest schools, though the difference was smaller at the elementary level than in high school. Approximately 59% of the superintendents reported the closing of certain schools so as to force students of different racial and ethnic groups to attend the remaining schools. Almost half the superintendents reported the establishment of schools with limited grade levels (e.g., grades K-2 or 3 through 6), and a third reported the pairing of schools; both of these procedures, like the closing of schools, are designed to cause students from wider geographic areas and broader racial/ethnic spectra to attend the same schools.

On the item asking about the one most common student assignment practice, the most frequent response at both the elementary level (47%) and the secondary level (62%) was assignment by geographic area. The next most common response

TABLE VII-4. PERCENTAGE OF NON-MINORITY AND MINORITY ELEMENTARY STUDENTS IN THE ESAA BASIC EVALUATION DISTRICTS WHO ATTENDED, FOR DESEGREGATION PURPOSES, A SCHOOL THAT WAS NOT THE SCHOOL NEAREST TO THEIR HOME

Percentage of Students in District	Type of Students					
	NON-MINORITY			MINORITY		
	Number of Districts (N=36)	Percentage of Districts	Range of Total District Enrollments	Number of Districts (N=38)	Percentage of Districts	Range of Total District Enrollments
0	9	25	6,805-216,982	6	16	6,805-8,932
1-10	15	42	3,881-88,125	14	42	3,881-216,982
11-30	10	28	3,741-119,542	4	11	4,997-26,761
31-50	1	3	15,558	6	16	10,677-119,542
51-85	1	3	111,540	6	16	3,741-77,133
86-100	0	0	--	0	0	--

TABLE VII-5. PERCENTAGE OF NON-MINORITY AND MINORITY SECONDARY STUDENTS IN THE ESAA BASIC EVALUATION DISTRICTS WHO ATTENDED, FOR DESEGREGATION PURPOSES, A SCHOOL THAT WAS NOT THE SCHOOL NEAREST TO THEIR HOME

Percentage of Students in District	Type of Students					
	NON-MINORITY			MINORITY		
	Number of Districts (N=34)	Percentage of Districts	Range of Total District Enrollments	Number of Districts (N=34)	Percentage of Districts	Range of Total District Enrollments
0	15	44	4,997-216,982	6	18	6,805-8,932
1-10	13	38	3,881-119,542	13	38	3,881-216,982
11-30	4	12	28,830-111,540	6	18	21,146-119,542
31-50	1	3	10,320	6	18	10,320-111,540
51-85	1	3	3,741	1	3	34,194
86-100	0	--	--	2	6	3,741-55,431

(38% and 27% at elementary and secondary levels, respectively), was the use of bussing. Relatively few superintendents specified other techniques, and none indicated the use of intelligence or achievement as the primary assignment criterion.

Several interesting relationships were found between the types of desegregation methods employed, and certain district characteristics. For example, districts that listed bussing among the elements in their desegregation plans tended to have low percentages of minority students and/or large district enrollments. There was also a slight tendency for bussing to be associated with high Desegregation Index values, but this pattern was somewhat equivocal.

Of particular interest, because of its direct relevance to the bussing issue, was the item asking about the district's primary assignment procedure. Districts designating bussing as their major assignment practice showed a relatively strong and consistent pattern of high Desegregation Index values (i.e., good racial balance).* In addition, such districts tended to have low percentages of minority students and small enrollment sizes. These relationships were stronger at the elementary level than at the secondary level.

The drawing of new school boundaries so as to provide better balance in the proportions of students of different racial/ethnic groups assigned to a given school was also a common practice. Districts utilizing this method generally had low percentages of minority students and larger district enrollments. Furthermore, these districts were typically serving medium-sized or large communities rather than small towns. These results are not too surprising, since in a small district or community with few schools, there is likely to be much less flexibility in the arrangment of school boundaries.

Although the remaining desegregation techniques were used less often, there were some noteworthy relationships. Districts most likely to use the closing of schools were those with relatively good racial balance across schools (high D.I. values). Of the districts indicating the use of assignment of students by geographic area, 30% had low D.I. values (.25-.54) and approximately 70% were operating under court orders. The pairing of schools and the establishment of schools with limited grade levels as desegregation methods were not related in any meaningful way to any district characteristics.

---

*The stronger relationship between bussing and the Desegregation Index for this item, as compared with the item inquiring about all elements of the districts' desegregation plans, reflects differences in the composition of districts designating bussing on the two items. Thirty-two districts listed bussing as one element in their desegregation plans, while only 13 listed it as the major assignment practice. These latter 13 districts were a subset of the 32 districts, but differed from the remaining 19 districts in district size and percentage of minority students. Overall, the 13 districts were smaller and had smaller percentages of minority students than the other 19 districts.

D. AMOUNT OF DESEGREGATION IN ESAA YEAR I (1973-1974)

The amount of desegregation occurring in the 46 sample Basic districts during ESAA Year I was calculated by taking the difference between the 1973-1974 and 1972-1973 D.I. values for each district. It should be noted that the D.I. values show the districts' status at the start of the school year; thus, the differences in the D.I. values for the two years represent the differences between approximately October 1972 and October 1973. A more meaningful comparison, reflecting changes made during the first year of ESAA implementation, would be a contrast of D.I. status in October 1973 and October 1974. Such a comparison will be provided in a subsequent report after the second-year data have been analyzed.

Analysis of the D.I. values for October 1972 and October 1973 indicated that little change in desegregation occurred in most districts during that period. There were some slight positive changes (toward greater desegregation) in 24% of the districts, relatively large positive changes in 20%, no change in 28%, and some slight negative changes in 28% of the districts. These findings are somewhat expected, and tend to reinforce the contention that ESAA funds were used largely to meet needs incident to reduction in segregation and discrimination, rather than to initiate desegregation.

Two districts in the 1973-1974 ESAA evaluation sample did begin desegregation activities directly before the beginning of the 1973-1974 school year. Part of the ESAA funds in those districts may have been used to assist in desegregation activities, so that the classrooms and schools within the district would be more racially balanced before the 1973-1974 school year. One of the two districts had an appreciable gain in its district D.I. value (.4); its characteristics are described more fully below. The other district also made a small positive gain (.03) in its D.I. value.

As noted above, 10 districts made fairly sizable gains in desegregating their schools. These gains in D.I. values ranged from .1 to .5, with seven districts concentrated at the .1 level and one district each at the .2, .4, and .5 levels. Tables VII-6 and VII-7 describe the characteristics of these districts with respect to HEW region, number of years desegregating, compliance code, percentage of minority students in the districts in Fall 1973, and the enrollment and total number of minority students in each of the districts for the 1972-1973 and 1973-1974 school years. Enrollment figures were not available for the district with the .4 gain in district D.I. value.

The majority of these 10 districts were in either the South Central or Southeast regions of the country, and were operating under court-order compliance codes. The three districts making the largest gains in desegregation were all operating under court orders. Three of the 10 districts were operating under 441 compliance codes, and they tended to make smaller positive gains. The number of years each district had been desegregating varied widely from zero to 20 years. Low, moderate, and high minority-percentage districts were all represented in the 10 districts making noticeable positive gains in desegregating their schools.

TABLE VII-6. RELATIONSHIP BETWEEN DISTRICT D.I. GAINS AND HEW REGION, NUMBER OF YEARS DESEGREGATING, COMPLIANCE CODE, AND PERCENTAGE OF MINORITY STUDENTS IN DISTRICT IN FALL 1973

Gain in District D.I. Value	Number of Districts	HEW Regions	Number of Years Desegregating	Compliance Code	Percentage of Minority Students in District in Fall 1973
		District			
.1	7	1. South Central	20	441	26.3
		2. South Central	11	Court Order	77.9
		3. South Central	9	Court Order	18.5
		4. Southeast	6	Court Order	27.3
		5. Southeast	4	Court Order	81.8
		6. Pacific Southwest	1	441	50.7
		7. Central Midwest	1	441	59.4
.2	1	South Central	3	Court Order	42.3
.4	1	Mid-Atlantic	0	Court Order	30.2
.5	1	Southeast	2	Court Order	68.3

TABLE VII-7. RELATIONSHIP BETWEEN DISTRICT D.I. GAIN
IN FALL 1973 AND TOTAL DISTRICT
ENROLLMENT SIZE

Gain in District D.I. Value	Number of Districts	District	Total District Enrollment		Total Number of Minority Students	
			1972-1973	1973-1974	1972-1973	1973-1974
.1	7	1.	7,734	7,571	1,997	1,993
		2.	16,774	17,320	11,906	13,499
		3.	23,262	20,828	6,431	5,700
		4.	27,014	27,127	12,791	13,770
		5.	27,211	28,234	5,123	5,233
		6.	65,414	62,096	35,578	36,941
		7.	96,006	88,125	74,323	72,128
.2	1		82,268	77,133	33,429	32,678
.4	1		DATA NOT AVAILABLE			
.5	1		138,714	119,542	80,403	81,696

E. SUMMARY

Overall, little new desegregation was found to have occurred in most of the sample ESAA Basic districts between October 1972 and October 1973, although 20% of the districts did show an appreciable gain in desegregation index (D.I.) values over that period. The probable explanation for the lack of gain in most districts is that a substantial portion of the districts started with moderately high or high D.I. values in October 1972, and most had already been desegregating for several years before the start of the ESAA program. Taken together with other data on the districts' desegregation plans, these results suggest that most of the sample Basic districts used their supplemental funds to meet needs related to desegregation activities already implemented or in process, rather than to start new desegregation activities.

The most common means taken by districts to desegregate were redrawing school boundaries and bussing students from other areas. These methods were used especially by districts with large enrollments with relatively small percentages of minority students (e.g., 10% to 39%). There was also some evidence that bussing was associated with districts that had greater racial balance (higher D.I. values). Somewhat less often reported, but still fairly common, was the closing of some schools or the restriction of certain schools to a smaller range of grade levels--both of these being methods of drawing from larger geographic areas and forcing students of different racial/ethnic groups to attend the same school.

CHAPTER VIII

STUDENT GAINS IN ACHIEVEMENT TEST SCORES

Previous chapters of this report have indicated the academic needs of students in Basic and Pilot schools in terms of their performance on reading and math tests, as well as the generally low socioeconomic level of the students' families. Also evidenced were the needs of the sample districts and schools in terms of their concentration of disadvantaged students, as well as special needs related to desegregation or to minority-group isolation. The earlier chapters further indicated an apparent emphasis of the programs on meeting legislative objectives, and a focus of resource allocations (dollars and services) on school and student needs. The present chapter is concerned with the effects of those resource allocations on the achievement of students in ESAA-funded districts.

A. TREATMENT-CONTROL COMPARISONS OF ACHIEVEMENT TEST GAINS

This section describes the results of analyses of the differential effects in student outcome associated with the manipulation of the experimental variable--the presence or absence of ESAA funding. All of the analyses reviewed in this chapter have as their fundamental focus the possible effects of ESAA funding on student achievement outcomes. For the remainder of this chapter, the term "impact" refers specifically to analyses dealing with differences between ESAA-funded (treatment) and non-funded (control) schools.

Before considering the actual methodology and results of the experimental analyses, it is important to review three factors greatly affecting the relevance of the findings for educational policy. First, the pretest-posttest interval was quite short. The average interval was less than 5-1/2 months, with 93% of the schools being posttested in a period of five to six months after pretest. There was little time for the ESAA funding to exert its influence on student performance, especially since, in this first year of ESAA, many districts were late in full-scale program implementation. Second, in many of the sample districts there was less than 5% difference in total funding between the treatment and control schools, and in a few cases, the control school actually had greater funding. Finally, there were extremely few systematic or pervasive program differences between treatment and control schools. In other words, the control schools tended not only to have nearly as much money as the treatment schools, but also to spend that money for similar kinds of program activities.

These findings greatly reduce any expectation of obtaining consistent treatment-control outcome differences in the first year of the evaluation. Further, they suggest that little weight should be given to the first-year impact analysis findings in formulating educational policies related to the ESAA program. It seems fairly clear that for the first-year results, at least, less interpretive emphasis should be given to analyses of the effects of ESAA dollars per se, and greater emphasis should be placed on discovering the types of program activities (regardless of the source of funding) that were more beneficial to ESAA-eligible students. (This latter approach is represented by the exploratory analyses described in Chapter IX).

Despite the difficulties anticipated in interpreting the impact analyses, it was felt that those analyses could possibly reveal some findings of interest. The remainder of this first section describes the impact analyses and their outcomes.

1. EXPERIMENTAL PARADIGM

The analyses performed to evaluate the impact of ESAA funding were derived from the experimental design of the evaluation study. In this design, a pair of schools, similar in ethnic composition, prior achievement level, and socioeconomic level, was selected from each sample district. Members of each pair were then randomly assigned to treatment (ESAA-funded) and control (non-funded) conditions.

The achievement test data are characterized within the framework of a two-dimensional array where the treatment-control distinction accounts for one dimension and the districts themselves account for the other. The entries in each cell are the outcome measures against which impact is to be evaluated. For purposes of these analyses, the data are the values of the individual outcome measures, collected on each student but aggregated to the level of the school.

Outcome measures used for these analyses were adjusted posttest achievement scores. The premise behind the use of these adjustments was that each student's posttest performance was determined by two sets of factors, one set consisting of personal and background characteristics plus pre-evaluation educational experiences and the other set reflecting the student's educational experiences during the evaluation period. The purpose of the adjustment procedures was to modify each student's posttest score upward or downward so as to eliminate or reduce the presumed differential effects of the first set of factors, i.e., the pre-evaluation factors; in this way, theoretically, the posttest scores would more accurately reflect the impact on achievement of the student's learning experiences during the evaluation period. In the present case, determination of the appropriate adjustments was based on the best-fitting regression of student-level posttest measures on pretest measures and student background variables. These equations were determined in the within-school regression space for each of the three evaluation samples (Pilot, Basic elementary, and Basic secondary), using the student as the unit of analysis.

Table VIII-1 indicates the final set of variables used as covariates in each of the three evaluation samples. For all outcome measures, the pretest measure of that outcome was always the best predictor. For all outcomes except vocabulary, the pretest on vocabulary (used as a generalized aptitude measure) contributed significantly to the prediction of outcome once prior achievement had been accounted for. Finally, for elementary students, the socioeconomic status (SES) measure derived from the number of educationally related possessions in the home contributed a small but meaningful amount to the prediction. The search was stopped at this point, since the contributions of the highest priority variables were becoming quite small.

Because regression slopes departed noticeably from being homogeneous within the Basic samples, and because in these groups there was a substantial proportion of non-minority students, separate regressions were determined as outlined above for minority and non-minority students. The set of predictor variables for these separate regressions did not change, but the slopes did. Final analyses were performed using different coefficients for the two groups of students. Tests of equality of slope within sample units were satisfied when students were separated in this way.

TABLE VIII-1. FINAL SET OF COVARIATES BY EVALUATION SAMPLE

Evaluation Sample	Covariates		
	Pretest	Pretest Vocabulary	SES/Reading
Pilot	X	X	X
Basic Elementary	X	X	X
Basic Secondary	X	X	

In attempting to establish a final set of adjusted posttest achievement measures, several steps were taken to deal with the fact that some students had missing data on the adjustment variables. Since the number of students with data missing for race and SES/reading was small (less than 0.5%), an attempt was made to fit a value (i.e., to estimate the probable values of the missing data) rather than to drop such cases from the analysis. It was felt that further reduction of within-group sample size was potentially more damaging to the analysis than was the imprecision introduced by fitting these values.

For secondary students, the primary data on racial identification were derived from the Secondary School Questionnaire. Where these data were missing, data from the Teacher Questionnaire were used. Where both types of data were missing for a particular student, the regression equation for the group (minority or non-minority) with the largest membership within that particular school and grade was used.

For Basic elementary students, the Teacher Questionnaire provided the primary racial identification data, because it was felt that this information would probably be more accurate than the children's own responses. When this was missing, the Elementary School Questionnaire data were used. Where data were missing from both sources, the same value-setting procedure used for secondary students was employed. For Pilot students (who by definition were in minority-isolated schools), a single regression formula was used, and racial identification was therefore not necessary.

In the case of missing SES data, the within-school and within-grade mean value of the SES index for that student's own racial group was assigned to the individual. Where information on the student's race was missing, or where there were fewer than three students of that particular race in a grade in a school, the overall mean of students in that grade and school was used.

The procedure described above allowed the prediction of an adjusted posttest score for every student having pretest and posttest scores.

a. Overall Impact Evaluation

The primary means selected to evaluate the overall effect of ESAA funding was an analysis-of-variance framework. A treatment-by-blocks design was used in which the "treatment" was the funded/non-funded distinction, and districts were considered blocks. While the overall treatment effect could have been estimated by comparing the averaged outcome of funded schools and non-funded schools, the use of the treatment-by-blocks design increased the precision of this estimation. This increase in precision occurred by taking into account the known variability between districts. To the extent that the schools differed along dimensions associated with the outcome measures, the use of a treatment-by-blocks design would remove the contribution of between-districts variability from the error variance, thereby reducing the standard error of the estimate of the effect.

b. Evaluation of Differential Program Impacts

An important question in this evaluation was whether the impact of ESAA funding was different for different kinds of districts. To address this question, a series of analyses was undertaken to examine the differential impact of ESAA funding among defined subgroups of the districts. These analyses involved an extension of the basic design model to include a dimension along which districts were divided into subgroups (blocks). Such dimensions could be defined for variables that had the district as a fundamental referent, or that were appropriately aggregated to the level of the district.

The three types of blocking or subgrouping variables used in the evaluation of differential program impacts are discussed along with the results of these analyses in a later section of this chapter. Briefly, the first type of blocking variable relates to program funding, the second to program intensity, and the third to the focus of program objectives. It is important to keep in mind that, although the description of blocking variables refers to attributes of the treatment school, it was the district that administered the program; thus, the variables discussed here reflect district-level decision-making.

2. RESULTS

The following sections describe the results of applying the methodological procedures described above to the data resulting from the first year of the ESAA evaluation.

a. Overall Impact

Within the framework of the original experimental design, overall impact of ESAA funding was assessed by conducting treatment-by-district analyses of variance for each program type and grade level, using as the dependent variable the covariate-adjusted posttest score aggregated to the school level. Separate analyses were conducted for each of the mathematics and reading subtests. As a check on possible anomalies resulting from the adjustment of posttest scores, all analyses were repeated using raw gain scores; in no instance was there a meaningful deviation in results for the two methods. Thus, all analyses reported here are based on the use of the adjusted scores.

Table A-28 of the Appendix presents a summary of each of the F values computed. In each case, a sign has been attached to the value to indicate whether the achievement test score difference favored the treatment school (+ sign) or the control school (- sign).

Two analyses were conducted on the Basic elementary sample. One of these used all students; the other included only minority students so that it could be compared with the minority-isolated Pilot sample. Results for both analyses are included in Table A-19.

Overall, the impact analysis did not show any meaningful, interpretable patterns. The number of significant F values was no greater than would have been expected from sampling fluctuations alone. In summary, there was no clear evidence in this analysis of a differential achievement effect that might be attributed to ESAA funding.

b. Differential Impact for Different Blocks of Districts

Two sets of impact analyses were performed using blocking on district variables. The first set used variables related to funding levels in the schools, while the second focused on two general areas related to program characteristics. The definitions of the variables used and the results of each set of analyses are described in the following sections. Again, all analyses were repeated using raw gain scores to verify that no differences in outcomes resulted from use of the raw scores.

(1) Blocking by Funding Levels

(a) Definition of Blocking Variables. To assess the overall and differential effects of different amounts of regular, supplemental, and ESAA funds on the success of instructional programs, a series of blocked analyses were performed using funding data as blocking factors. The first factor was used to create three strata based on the amount of ESAA dollars available in the treatment school. The second funding factor was based on the total supplemental funds in the treatment school (including ESAA). The third factor examined the difference between treatment and control schools in terms of total supplemental funds, yielding categories where the treatment school got considerably more supplemental money than the paired control school, about the same amount, or less supplemental money than the control school. The fourth factor used stratification of regular district funds. All funding figures were based on standardized per-pupil expenditures.

(b) Results of Impact Analysis Blocked by Funding. Tables A-20 through A-23 in the Appendix summarize the F-ratios for the interaction between the effect of funding as a blocking factor and the treatment-control effect. For the three grade levels in each of the three evaluation samples, tests were made on both raw gains and adjusted scores on each of the four (or five, at the secondary level) subtests. Thus, a total of 312 statistical tests were made in this analysis. Of these, only 16 (or 5.1%) were significant at the 5% level, or no more than would have been expected by chance. Overall, therefore, there was no clear evidence in these blocked analyses of treatment effect.

(2) Blocking by Program Characteristics

The impact analysis with blocking on program characteristics used two general program features as the blocking factors: program intensity and program focus. Each of these factors was separated into two content areas, reading and math. Program focus was operationalized by averaging the ranks assigned to various instructional objectives in reading and in math by the reading and math teachers in each school.

(a) Definition of Blocking Variables. The variables used in the program intensity blocking analyses were derived from data related to student exposure to several reading and math activities. The Student Attendance and Exposure Log (SAL) provided a weekly record of the number of hours each ESAA student received instruction in reading, math, and intergroup activities. SAL data were collected on each student over a period of seven months, providing estimates of the student's weekly exposure to program activities. The SAL exposure categories for each individual program activity were coded to approximate an interval scale.

Summary indices for both reading and math exposure were computed by totaling the number of hours of instruction in each component activity of the reading section and the math section, and averaging these total figures over the number of months of data obtained for each student. These average total weekly estimates of math and reading exposure were aggregated to the school level for each grade in each of the three evaluation samples. Treatment-control school differences in math and reading exposure were then computed, and grouped into two or more blocks for the blocking analyses.

The program focus variables defined the instructional program objectives reportedly emphasized by teachers in the four content areas of the achievement test, i.e., reading vocabulary, reading comprehension, math computation, and math concepts.

Two variables were used as indicators of reading program focus:

1. Word techniques--Emphasizing development of vocabulary skills through recognition of basic sight words, phonic analysis of words, and structural analysis of words.

2. Word comprehension--Emphasizing development of skills for using context clues, development of comprehension skills, and improvement of comprehension rate.

Two additional variables were used as indicators of math program focus:

1. Math computation (emphasizing operations).

2. Math concepts (emphasizing math concepts and terminology).*

---

*Math program focus indicators were badly skewed, since all teachers reported major emphasis on math concepts and operations. At the third- and fourth-grade levels in Pilot programs, insufficient variability in the proposed blocking variable precluded any attempt at conducting the blocked analyses.

Each individual reading and math program objective was ranked by the reading and math teachers as follows: major goal, "3"; secondary goal, "2"; little or no importance, "1." A high score on a particular focus index (e.g., word techniques or math computation) indicated a strong emphasis on that objective in the teacher's reading or math program. The scores from the focus indices at the teacher level were then aggregated to the school level for each grade in each of the three evaluation samples.

(b) Results of Impact Analyses Blocked by Program Characteristics. For each of the six variables described above, a blocked impact analysis was conducted with both raw gain and adjusted scores on each of the four (or five, at the secondary level) subtests in the three grades in each of the three samples. Tables A-24 through A-29 in the Appendix present the F-ratios for the interaction effect between the blocking factor and the treatment-control effect. A total of 452 such tests were made, of which only 22 (or 4.86%) were significant at the 5% level. Few of the significant interaction effects showed any meaningful pattern, and none showed consistency across grades within subtests or across subtests within grades.

4. SUMMARY

As noted at the beginning of this chapter, the short pretest-posttest interval, combined with the relatively small treatment-control differences in funding levels and program characteristics, made it improbable that consistent or sizable differences in achievement test gains would be found. It was not surprising, therefore, that the impact analyses showed no evidence of significant treatment-control differences in achievement gains. This finding was consistent across grade levels, criterion measures (reading and math), and program types (Basic and Pilot); furthermore, no treatment-control differences were found when districts were subgrouped (blocked) on several dimensions related to funding levels, program intensity, and program objectives.

B. ANALYSIS OF TEST GAINS IN ESAA-ELIGIBLE SCHOOLS (TREATMENT PLUS CONTROL)

An important issue in this study was whether students in the evaluation sample made achievement test gains during the school year that were of statistical and practical significance. To examine this question, analyses of achievement gains were performed across both treatment and control schools. One argument for including the control schools was the finding, reported in earlier chapters, that treatment and control schools in many districts did not differ greatly in either per-pupil funding or program characteristics. In addition, informal discussions with school officials indicated that, in certain districts at least, the award of ESAA funds to those districts might have led to greater total per-pupil allocations in control as well as treatment schools, due to shifts of non-ESAA supplemental funds to the control schools. For these reasons, emphasis in the present analyses was placed on academic growth in the sample of ESAA-eligible schools, as represented by both treatment and control schools. These ESAA-eligible schools typically received greater supplemental funds of various types (Title I, Title III, etc.) than non-eligible schools because they have larger proportions of disadvantaged students. Analyses of overall achievement gains across the eligible schools may therefore help to assess the possible beneficial effects of the total supplemental funding.

1. STUDENT ACHIEVEMENT GAINS AGGREGATED ACROSS DISTRICTS

Some gains in absolute performance between pretest and posttest would, of course, be expected irrespective of supplemental school funding. The question is whether these gains were greater than might have been expected in the sample schools had those schools not been receiving such extensive supplemental funding. One set of benchmarks for assessing the sample schools' gains can be obtained from test publishers' normative tables. By using those tables to calculate grade equivalents for the sample students' pretest and posttest scores, amounts of actual gain in grade equivalent (GE) units can be determined. Table VIII-2 shows the pretest and posttest grade equivalents for achievement levels of the sample students used in all subsequent analyses.* For purposes of these analyses, all student scores within a given grade and program type were combined, irrespective of treatment-control designations. To illustrate the interpretation of the table values, Pilot third-graders, who should by national normative standards have had a grade equivalent of 3.10 in reading vocabulary at pretest, actually had a grade equivalent of 2.10, which corresponds to the performance expected of average students at the beginning of the second grade. Similarly, the expected grade equivalents for average students at the time the Pilot third-graders took the posttest would be 3.80; the actual grade equivalent in reading vocabulary for those sample Pilot students was 2.65.

The final column in Table VIII-2 shows the difference, in grade-equivalent units, between the sample students' pretest and posttest achievement scores. Since the average interval for sample students was very slightly over five-and-a-half months (168 days), it might have been expected that average students would, overall, have made test gains corresponding to .55 grade-equivalent units. As seen in Table VIII-2, the actual gains in grade equivalent approximated or exceeded this "average" gain figure for most grade levels and most subtests across both the Basic and Pilot samples. This appears to be a very positive finding in view of the fact that the sample students were in no sense "average" students. Rather, they were economically disadvantaged and had a prior history of making considerably smaller-than-average achievement gains, as evidenced by their low grade-equivalent scores on the pretest. Thus, it would not have been expected that the sample students would have made pretest-posttest gains as large as those of average students.

Looking at particular programs and grade levels in Table VIII-2, Pilot elementary students (treatment and control) made gains at or slightly below those expected for average students in reading and generally above the expected** levels in mathematics. Basic elementary student gains were generally around the expected values for reading and well above those values in reading vocabulary at the

---

*These grade equivalents have been interpolated to half-month intervals to account for cases where the observed mean fell almost exactly between the scores associated with the full-month values.

**For simplicity, the term "expected gains" is used throughout this section when referring to the gains expected of average students, It should be recognized, however, that for reasons discussed in the preceeding paragraph, such gains would not have been expected of the sample students.

TABLE VIII-2. STUDENT PERFORMANCE LEVELS (TREATMENT AND CONTROL) AND GRADE EQUIVALENTS

Reading Vocabulary

Program	Grade	Pretest GE*	Posttest GE	GE Difference
Pilot	3	2.10	2.65	.55
	4	2.40	2.90	.50
	5	3.20	3.75	.55
Basic	3	2.60	3.10	.50
	4	3.00	3.80	.80
	5	4.00	4.75	.75

Reading Comprehension

Pilot	3	2.20	2.70	.50
	4	2.70	3.20	.50
	5	3.40	3.80	.40
Basic	3	2.70	3.00	.40
	4	3.20	3.75	.55
	5	4.10	4.60	.50

Mathematics Concepts

Pilot	3	1.80	2.50	.70
	4	2.30	2.90	.60
	5	3.10	3.70	.60
Basic	3	2.30	2.90	.60
	4	2.80	3.60	.80
	5	4.30	4.90	.60
	10	8.10	8.40	.30
	11	8.40	8.90	.50
	12	8.60	9.00	.40

Mathematics Computation

Pilot	3	2.20	3.00	.80
	4	3.10	3.70	.60
	5	4.00	4.40	.40
Basic	3	2.40	3.30	.90
	4	3.30	4.00	.70
	5	4.30	4.90	.60
	10	7.60	8.10	.50
	11	8.20	8.60	.40
	12	8.40	8.90	.50

*Grade equivalent

TABLE VIII-2. STUDENT PERFORMANCE LEVELS (TREATMENT AND CONTROL) AND GRADE EQUIVALENTS (CONTINUED)

Mathematics Problems

Program	Grade	Pretest GE*	Posttest GE	GE Difference
Basic	10	7.60	8.30	.70
	11	8.10	9.00	.90
	12	8.60	9.30	.70

*Grade equivalent

fourth and fifth grades; in math the gains were almost uniformly well above the expected levels. Gains of the Basic secondary sample students ran somewhat below the expected values in math concepts and computation, but consistently, and by a considerable margin, exceeded expectations in math problems.

It is important that considerable caution be exercised in interpreting these results, because the publisher's norms on which the comparisons are based were interpolated for other than end-of-year performance. In constructing the norms, the publishers tested samples of students late in the school year at each grade level. Assuming that no growth would occur over the summer months and that growth over the period of schooling would be linear, they interpolated norms for beginning and middle-of-year testing periods. The validity of these assumptions has not been tested, nor is is readily possible to obtain data collected at various periods over the school year and summer on comparable samples of students.

A second concern is the shape of the growth curve typically associated with standardized achievement tests during the school year. Is growth linear during the school year, or is it more rapid at certain periods than at others? No available data provide a clear answer to this question, yet it is an important consideration in attempting to make statements about "expected" growth during some segment of the school year.

Finally, even assuming that gains of the sample students were higher than might have been expected, there is no basis for attributing the gains to the effects of ESAA dollars, or even necessarily to those of supplemental funds in general.

Despite these reservations, there appear to be important indications in the first-year evaluation data that disadvantaged students in the ESAA-eligible schools made achievement test gains very similar to those expected for average students. Such a finding, however tentative, is quite encouraging and will be further explored in the analyses of second- and third-year data.

2. COMPARISONS OF SCHOOL-LEVEL GAINS WITH GROWTH CRITERIA

Whereas the preceding section aggregated achievement data across districts, the analyses reported in this section use achievement data aggregated to the school level. For purposes of this discussion, the publishers' test norms and the assumptions about student growth (e.g., interpolation of norms for non-empirical testing points, assumption of linear growth) are accepted. It must again be recognized, however that these are assumptions and are subject to later verification, to the extent possible. The longitudinal nature of the evaluation allows later testing of the no-growth-over-summer-months assumption implied in the interpolation procedures used by the test publishers. Examination of 1975 pretest data will be crucial in the final assessment of first-year gains.

Analyses discussed in this section again address the question of whether gains in the sample schools (treatment and control) were larger than could have been expected in schools having large concentrations of disadvantaged and academically needy students. One difficulty in answering this question is that there is no established consensus among educators or psychometricians on the definition of "expected" gains against which observed gains should be compared. In particular, there is no general agreement as to how allowance should be made in these expectations for the economic and educational deficits of the sample students. To provide a range of possible interpretations and a framework within which readers can reference their own expectations, three different growth criteria were established for the present analyses. These are described in the following paragraphs.

Criterion 1: Growth at the median level for the normative sample. For each grade level, a calculation was made of the Achievement Development Scale Score (ADSS)* associated with the median (50th percentile) of the pretest and posttest distributions. On the assumption that these values represented a typical student in the publishers' normative sample, a determination was made of how much change between these two scores was necessary for the student beginning at the 50th percentile to maintain that same relative position at posttest. Such a calculation ignores certain problems of metric properties of changes at a particular score level,** but is useful for comparative purposes vis a vis "typical" growth.

Criterion 2: Maintenance of pretest percentile. For each of the evaluation samples, at each grade level and for each subtest, the percentile rank associated with the observed pretest mean score was obtained from the publishers' norm tables. The scores necessary to maintain this same relative position in the posttest distribution were obtained from the same tables. The difference between these two scores was then used as the second criterion for the particular grade level and subtest in question. Depending on whether the pretest and posttest distributions retain the same variabilities or change in variability, this criterion value can be quite different from that generated by the first criterion.

---

*A single scale of standard scores for use with all levels and any form of the CAT has been developed. These ADSS scores use three-digit numbers ranging from 100 to 900. They enable the user to chart a student's growth from grade 1.5 through grade 12, regardless of which level or form of the CAT is used.

**Such problems include the difficulty in raising achievement scores by one point for low achievers (many remaining items, of a wide difficulty range) versus effecting a score difference of one point for high achievers (few items remaining, all of which are very difficult).

Criterion 3: Depressed normal growth rate. There is some tentative evidence from earlier studies of compensatory education, such as local ESEA Title I reports, that disadvantaged students such as those in the present study typically make achievement test gains approximately two-thirds the size of those made by average students as defined by national test norms.* Though this presumed relationship has not been given enough systematic study to be well established, it is certainly consistent with the tendency of disadvantaged students to fall further and further behind their more fortunate agemates as they move through successive grades.

For elementary students, data from SDC's earlier restandardization study were used to estimate the growth rates of disadvantaged students.** The restandardization data provided grade-equivalent values of actual scores for Pilot-eligible students at the end of the third, fourth, and fifth grades. These empirical values were compared with expected values, based on the students' grade level and time of testing, to determine the restandardization sample's relative growth rate. For example, a third-grade student tested in May should have a grade equivalent of 3.8; if his actual grade equivalent was 2.9, this would mean that he was progressing at about three-fourths the average rate for the third-grade population as a whole. Actually, it was found that the growth rate values for the restandardization sample, across grades and content areas, ranged in a very narrow band around the popularly accepted two-thirds value. To establish the third criterion, therefore, these empirically developed growth-rate values were used as scale factors in a downward adjustment of the gains required to meet Criterion 1. For example, if the criterion of maintaining median position (Criterion 1) involved a pretest-posttest gain in grade equivalent of 0.6, but the previous gain rate of a particular sample group was only seven-tenths of the gain for average students, then the "expected" gain for that subsample would be adjusted to 0.6 x 0.7, or 0.42 grade-equivalent units.

At the secondary level, where empirical baseline data on growth rates were not available, the two-thirds approximation was used as the scaling factor.

Since all analyses were conducted using scale scores, several comparisons and interpolations were necessary to obtain the required scale-score differences. The publishers' norms provide percentile ranks associated with discrete raw scores. When no discrete score fell at the 50th percentile point (or at the percentile point associated with the pretest criterion), interpolations were made. Once determined, these raw-score points were converted to ADSS score points, again often requiring an interpolation. All interpolations were linear over the score interval, and high accuracy was maintained.

It is extremely important in interpreting these criteria, and in assessing first-year achievement gains, to observe the necessary cautions implied in the construction of the criteria. The metric properties of these score differences, which are based on interpolated data and anchored to particular score points in the distribution, are wholly unknown. The criterion-related difference values should be viewed simply as crude indicators of amount of expected growth. Any confidence in such findings must depend on consistency of patterns over different grade levels and over related subtest measures, rather than on any presumed precision in a particular "expected" growth value. Thus, one may be able to obtain a reasonable answer to the question, "Did a large number of schools exhibit average performance greater than the criterion?", but not to the question, "Did exactly 75% of the schools exhibit precisely one year's worth of growth during a year of schooling?"

---

*For a summary of findings of some of the earlier studies see Wargo, M.J., Compeau, P.L., and Tallmadge, G.K. Further Examination of Exemplary Programs for Educating Disadvantaged Children, American Institute for Research.

**Ozenne, D.G., Van Gelder, N.C., and Cohen, A.J. Emergency School Aid Act National Evaluation: Achievement Test Restandardization, TM-5236/006/00, System Development Corporation, November 1, 1974.

1. ANALYTIC TECHNIQUE

Once the effectiveness criteria were established, one serious methodological issue remained in attempting to evaluate the success of individual programs (or groups of programs) in meeting the criteria. This was the issue of spurious intergroup differences when multiple comparisons were made. In addition, it was desirable to make some statement of the confidence one might have in the observed gain.

The approach in analyzing these data derives from the Bayesian methodology. The specific methods used in the present analysis were provided by Novick, Wang, and Isaacs (1975). These techniques are especially helpful in making inferences about the success of a particular compensatory program when many individual program comparisons are being made, i.e., in solving what the research methodology literature calls the "multiple comparisons problem." Briefly, the multiple comparisons problem arises when it is desired to compare observed performance against performance for a large number of programs and when the number of observations for any one comparison is relatively small. In such situations, estimates of these individual program effects are imprecise, and apparent differences between programs (schools) may be found when those differences have occurred by chance and do not represent actual program effects. The Bayesian techniques employed here, termed M-group analysis, substantially increase the precision of the estimates because they use not only the direct information obtained from the observations in that particular unit (e.g., in a grade level within a given school within a program type), but also collateral information (performance of grade-level cohorts in other schools in the same program). The net effect of the Bayesian approach is a "pushback" of the individual estimates toward the overall mean in a manner analogous to using regression estimates of true score in place of observed scores in classical test theory. The Bayesian techniques provide estimates of average growth and associated variances as well as estimates of individual program effects.

The model for this analysis assumes that for each student there is a pretest and posttest. The means for a school on these two test administrations can be denoted as μB and μA, respectively. The primary concern is with the difference $\Delta = \mu A - \mu B$, the average difference between posttest and pretest scores. If this value is larger with respect to some criterion Δ_0, then it may be concluded that some gain has occurred. The true value of Δ cannot be known, but by using a Bayesian analysis, prior information can be combined with sample information to provide a posterior probability distribution for Δ. Then the a posteriori probability that $\Delta > \Delta_0$ (that the gain is greater than expected) is computed. If this probability is greater than .50, one might cautiously suggest that instruction has been effective in this school. If the probability is greater than .90, then one can conclude with much greater confidence that instruction is moving children, on the average, past the growth interval required to meet the criterion.

2. RESULTS

Using the methodology described above, gains were analyzed for each school in treatment-control pairs, for each evaluation sample and grade level. The tables in this section describe the percentage of schools in each of these groups whose mean achievement gain met or exceeded a given criterion at the stated probability level. The column entitled "Maintaining 50th Percentile" in Table VIII-3 indicates the actual percentage of schools whose average gain was equal to or greater than a particular criterion. The second column indicates the percentage of schools exceeding the criterion with probability greater than .90. The .90 level provides strong evidence that such a result reflects a true and stable effect rather than a chance occurrence.

a. Pilot Elementary Schools

In reading, the percentage of Pilot elementary schools having observed growth (test score gains) that met or exceeded the "disadvantaged student" criterion (Criterion 3) ranged from 43% to 81%, depending on grade and subtest. For five out of six grade-subtest combinations, over half the schools exceeded that criterion. The percentages of total Pilot sample schools meeting or exceeding Criterion 3 at the .90 level of confidence ranged from 13% to 47%; these correspond to roughly 30% to 60% of the schools observed to meet the criterion. Somewhat fewer schools (37% to 75%) were observed to maintain their relative pretest position (Criterion 2), but over the various grade-subtest combinations, more than half of the schools met that criterion; this in itself may be an encouraging sign considering the general tendency of disadvantaged students to lose ground in successive school years.

Within the reading area, Pilot sample students (treatment and control) performed slightly better in comprehension than in vocabulary, but results were quite varied at different grade levels. Overall, reading performance was highest at the fourth-grade level; that is, a larger percentage of schools met or exceeded each growth criterion at this grade than at either the third or fifth grades.

In mathematics, Pilot schools demonstrated much greater relative growth than in reading. This is reflected in the larger numbers of schools (well over half) meeting each criterion for almost every combination of subtest and grade level, and in the increased number of schools meeting the criteria at a .90 level of confidence. Performance was particularly notable in math concepts, where from 79% (grade 5) to 97% (grade 3) of the schools were observed to meet the "disadvantaged student" criterion (Criterion 3), and from 50% to 80% maintained relative pretest position (Criterion 2). The percentages of the total Pilot sample schools meeting or exceeding Criterion 3 at the .90 level of confidence in math concepts ranged from 47% to 83%; these correspond to roughly 60% to 85% of the schools observed to meet the criterion. Furthermore, the results were almost as encouraging for Criterion 2 (maintaining position), particularly in math comprehension. Overall, the evidence suggests strongly that Pilot elementary students made gains in math considerably larger than would normally have been expected of disadvantaged students.

TABLE VIII-3. PERCENTAGES OF SCHOOLS MEETING OR EXCEEDING ACHIEVEMENT GAIN CRITERIA AT A GIVEN PROBABILITY

PILOT							
Outcomes	Number of Schools	Maintaining 50th Percentile		Maintaining Relative Pretest Position		Maintaining "Disadvantaged" Growth Rate	
		% of Schools Meeting or Exceeding Criterion		% of Schools Meeting or Exceeding Criterion		% of Schools Meeting or Exceeding Criterion	
		Observed	p>.90	Observed	p>.90	Observed	p>.90
READING VOCABULARY							
Grade 3	30	0	0	37	10	43	13
4	36	53	25	75	39	81	47
5	34	24	3	47	9	53	15
READING COMPREHENSION							
Grade 3	30	27	3	40	7	67	30
4	36	58	14	67	22	72	42
5	34	38	9	41	12	71	26
MATH CONCEPTS							
Grade 3	30	80	23	80	20	97	83
4	36	61	25	61	14	92	58
5	34	50	24	50	26	79	47
MATH COMPREHENSION							
Grade 3	30	70	33	93	80	80	70
4	36	50	17	89	81	78	39
5	34	38	15	79	53	56	29

TABLE VIII-3. PERCENTAGES OF SCHOOLS MEETING OR EXCEEDING ACHIEVEMENT GAIN CRITERIA AT A GIVEN PROBABILITY (SHEET 2)

		BASIC					
		Maintaining 50th Percentile		Maintaining Relative Pretest Position		Maintaining "Disadvantaged" Growth Rate	
		% of Schools Meeting or Exceeding Criterion		% of Schools Meeting or Exceeding Criterion		% of Schools Meeting or Exceeding Criterion	
Outcomes	Number of Schools	Observed	p>.90	Observed	p>.90	Observed	p>.90
READING VOCABULARY							
Grade 3	72	4	1	31	7	44	12
4	70	90	67	94	76	99	87
5	70	27	4	56	19	73	29
READING COMPREHENSION							
Grade 3	72	26	10	26	10	65	31
4	70	51	14	70	27	84	46
5	70	20	4	30	7	63	20
MATH CONCEPTS							
Grade 3	73	90	57	68	32	100	92
4	70	77	43	39	16	97	76
5	70	57	16	51	13	89	57
10	22	41	27	50	32	50	36
11	20	60	35	59	32	65	35
12	22	82	68	90	75	82	68
MATH COMPREHENSION							
Grade 3	73	76	54	94	83	88	76
4	70	64	29	93	77	79	63
5	70	49	27	81	64	66	46
10	22	54	32	45	27	68	46
11	20	50	20	41	18	55	35
12	22	68	32	85	55	73	36
MATH PROBLEMS							
Grade 10	22	59	23	50	14	73	54
11	20	50	25	45	18	65	25
12	22	54	14	70	35	77	32

The percentage of schools exceeding the various criteria in math was higher at the lower grade levels than at the higher grades. This may indicate that the school programs were relatively more effective for younger students--a possibility that will be investigated more closely in subsequent reports using longitudinal data.

b. Basic Elementary Schools

In Basic elementary schools, reading gains were generally similar to those for Pilot schools, with 44% to 99% of the schools observed to meet or exceed the "disadvantaged student" criterion, and 26% to 94% maintaining relative pretest position (Criterion 2). Overall, well over half the schools met the "disadvantaged student" criterion; of the schools observed to meet the criterion, a .90 confidence level can be placed on roughly 55%. As in the Pilot sample, gains were higher in the fourth grade than in the third or the fifth.

Mathematics gains in Basic elementary sample schools exceeded each of the criteria in large percentages of schools. For example, the percentages of schools observed to meet or exceed the "disadvantaged student" criterion ranged from 50% to 100%, and the corresponding boundaries for Criterion 2 (maintain pretest position) were 41% to 94%. A very positive finding is that even the most stringent criterion (gain equivalent to maintaining a median position) was met by 41% to 90% of the Basic elementary schools; more than half of these observed cases meet the .90 confidence level.

c. Basic Secondary Schools

Only mathematics subtest results are available for Basic secondary schools, because no growth criteria could be derived from the publishers' norms in reading that would be analogous to the other criteria used here. It should also be noted in Table VIII-3 that there was an additional math subtest at the secondary level ("problems") that was not given at the elementary level.

Mathematics gains at the secondary level were highly encouraging, with substantial gains indicated by the numbers of schools meeting or exceeding each growth criterion, across subtests and grade levels. Percentages of schools observed to meet the "disadvantaged student" criterion ranged from 50% to 82%; corresponding ranges for Criterion 2 (maintaining relative pretest position) and Criterion 1 (gain equivalent to maintaining a median position) were 41% to 90%, and 41% to 82%, respectively.

Unlike the elementary schools, average gains in the secondary sample were higher in the higher grades. One possible explanation for this finding is selective attrition; that is, the poorer-achieving students may have dropped out of school. Longitudinal data in subsequent years of the study will be examined in an attempt to verify or refute this explanation.

C. SUMMARY OF GAIN ANALYSIS RESULTS

Treatment-control comparisons were not expected to show appreciable differences in achievement-test gains for the two groups, because of the short pretest-posttest interval, the early developmental stage of the ESAA programs, and the lack of major differences in many of the treatment-control pairs with respect to total per-pupil funding and program characteristics. Nevertheless, the analyses were performed, using analysis-of-variance techniques with and without blocking on certain district characteristics; the results, as anticipated, did not show any consistent pattern of treatment-control outcome differences.

A somewhat more positive picture was presented by analyses using achievement test data for combined treatment and control schools in the sample ESAA districts. In these analyses, it was found that many of the ESAA-eligible schools (both treatment and control) made average achievement test gains larger than might have been expected of disadvantaged students; in a fair number of cases they made gains as large as would have been expected of "average" students (based on national norms). These results appear highly encouraging in view of the fact that disadvantaged students, such as those represented in this evaluation, traditionally make substantially smaller gains than those of average students. Considerable care must be taken in interpreting the results, however, since the analyses involve a number of unsubstantiated assumptions concerning the shape of growth curves in the general population during a school year. Furthermore, the results were not entirely consistent or uniformly positive. Finally, even if the achievement gains were larger than would normally have been expected, there is no basis for attributing such results to ESAA funding. Although it is suspected that the relatively large amounts of total supplemental funds found in most ESAA-eligible schools might account for enhanced gains in the sample schools, no direct evidence is presently available to support such a contention. Analyses of second- and third-year data will be important in attempts to confirm some of the apparent trends and relationships observed or inferred in the initial evaluation year.

CHAPTER IX

EXPLORATORY ANALYSES

This chapter describes a set of exploratory analyses of the data collected in the first year of the ESAA evaluation. These analyses were non-experimental in nature; that is, they were not based on comparisons of randomly assigned treatment and control schools within districts, but instead cut across both categories of schools. Their purpose was to determine what types of school programs (regardless of funding source) were most effective for what types of students. The exploratory analyses contrast with the more general descriptive analyses reported earlier in this document (e.g., Chapters III through VII), in that the exploratory procedures usually involved more complex relationships among student, program, and outcome measures. They also differ from the experimentally-based impact analyses (Chapter VIII), in that the exploratory procedures examined a wider range of possible relationships, but at some cost in generalizability of the findings. Details of the exploratory analyses are presented and results are discussed in later sections of this chapter.

Within the general goal of defining relationships among student, program, and outcome dimensions, three objectives of the exploratory analyses can be distinguished. The first objective stemmed directly from the requirement expressed in the study's original Statement of Work, to "examine the interrelationships between program input, process, and output variables to determine which variables can be manipulated to improve program impact." The second objective, closely related to the first, was to explicate or elaborate the results of the school-level analyses of achievement gains. The third objective of the exploratory analyses was to determine what interactions and non-linearities existed in the relationships of the input, process, and output variables examined in this study, and how those interactions affected the substantive interpretations of the study's results.

Before the exploratory analyses could be conducted, several preliminary steps were required to determine the most useful subset of data elements (questionnaire items) to be used in the analyses. These steps involved careful screening of elements from the 3000-plus items in the original data set, so as to retain those items that would be most useful and relevant to the study objectives.

Efforts were made to select items that would (1) be readily interpretable for policy decisions and (2) reflect manipulable school, program, and process variables that might be expected to have direct impact on student outcomes. In many cases, two or more related items were combined into new composite variables, so as to help reduce the total number of items to fewer and more interpretable dimensions.

Two basic procedures were used in selecting items and in forming composite variables for use in the exploratory analyses. One approach, used in the early screening stages, involved a rational examination of all items to determine their relevance to the major evaluation issues and to ascertain which groups of items appeared to be tapping the same underlying dimensions or variables. Results of earlier studies were also used in this phase to pinpoint variables that were most likely to show significant relationships to student achievement. The second general approach was empirical, and involved preliminary correlational and factorial analyses to determine which items appeared to be related to each other and to achievement. By these combined procedures, the original set of items was reduced to a set numbering fewer than 150 items and composites.

The next section of this chapter describes the classes of items and composites retained for the exploratory analyses. Following this is a brief discussion of the statistical procedures used to perform those analyses. Finally, the results of the exploratory analyses are described and interpreted.

A. VARIABLE DEFINITION

This section describes the independent and dependent variables that were utilized in the exploratory analyses. Specific methodological and substantive issues in the definition of the dependent variables (achievement gains in reading and math) are discussed separately.

1. INDEPENDENT VARIABLES

One of the major tasks in the exploratory analyses was to specify, from the data available, a constellation of variables that might potentially influence academic achievement. The categories of independent variables selected and the general methodology used to define the variables are described below.

a. Categories of Variables

Categories of independent variables* were designated as follows:

- Individual student characteristics
- Individual teacher characteristics
- Instructional program (classroom) characteristics
- Contextual (school and district) characteristics
- Funding allocations

(1) Individual Student Characteristics

Among variables expected to have the most direct effect on learning were several characteristics of the student himself. These included two major sociodemographic characteristics: ethnicity and socioeconomic status. The student's academic orientation (e.g., his liking for school, his feelings about the importance of good grades, and his personal education expectations) was also examined, as were certain psychosocial characteristics such as internal/external locus-of-control and the nature of the student's interaction with his peers. Finally, the teacher's educational expectation of the student was treated, for purposes of the present analyses, as a student characteristic.

---

*The final set of variable mnemonics and their identification is available in Appendix A, Table A-39.

(2) Individual Teacher Characteristics

Selected characteristics of the student's teacher defined a second set of independent variables. These included, for example, the teacher's general training and teaching experience, his specialized inservice training in reading or math, and indicators of his effort and style, such as the number of resources generated by the teacher to supplement instruction and the flexibility or rigidity of his teaching approach.

(3) Instructional Program (Classroom) Characteristics

A third category of variables included certain characteristics of the instructional programs used in reading and mathematics, many of which were described in Chapter VI. Potentially important variables were the actual amount of time spent in reading and math activities (estimated by average total weekly exposure in reading and math) and the allocation of time spent in individual reading and math activities. Another set of variables examined here related to program focus, defined in terms of amount of emphasis on particular activities in reading and mathematics.

(4) Contextual (School and District) Characteristics

The broader context of the student's learning environment was defined by school- and district-level variables. Sociodemographic characteristics examined here included minority percentage in the school and overall student body SES level, as indicated by the principal's estimate of the percentage of students eligible for Title I funds. Also of interest were the teacher/pupil ratio in the school and the number of specialized reading and math personnel relative to total staff size.

Other contextual variables used in the exploratory analyses were characteristics related to desegregation programs and racial climate of the schools, such as the extent of bussing in the district and the extent of disruptions having racial/ethnic origins. The degree to which districts promoted desegregation programs was indicated by a frequency count of district activities such as media presentations, public meetings, and staff meetings.

Funding variables were a particularly important aspect of the district/school context, since they comprised a major set of variables in the evaluation design. School-level funding variables were defined in terms of total supplemental dollars per pupil spent in reading and math. District cost data were used to define regular dollars-per-pupil expenditure variables.

b. General Methodology Used to Define Variables

Since the unit of analysis in measuring academic achievement was the student, all data on independent variables, including data collected at the school and district level, were dis-aggregated, where necessary, to the individual student level. The complete specifications of these variables, including their questionnaire components, derivation, and coding, will be made available in a separate document. Since the questionnaire data were largely categorical, and at best ordinal in nature, single items were either coded to define dummy variables or ranked. Multiple-item composites were expressed as proportions, as net frequency counts of certain item responses, or as average ranks or rank sums of items representing a dimension or logical set.

2. DEPENDENT VARIABLES

The residualized total scale scores from the reading and mathematics achievement tests were the dependent variables for the overall exploratory analyses. The derivation and the rationale for the use of these scores are presented in the following paragraphs.

At the elementary level, the reading raw score was obtained for performance on the entire reading section of the California Achievement Test, Level 2 (grade 3) and Level 3 (grades 4 and 5). At grade 3, the mathematics test was composed of the items from the computation and concepts subtests, Level 2, omitting the problems section of the latter subtest. For grades 4 and 5, the mathematics test consisted of items from the computation subtest and the concepts subtest, Level 3, omitting the 20 items dealing with fractions in the computation subtest.

At the secondary level, the reading scores were based on performance on the Iowa Silent Reading Test, Level 2. The reading raw score was a total of raw scores on the Vocabulary and Reading Comprehension subtests. The entire mathematics test of the California Achievement Test, Level 5, was used to obtain the mathematics score utilized in these analyses.

The total raw scores were converted to total scale scores employing the norm tables furnished by the test publisher. This conversion allows direct comparison of results across test forms and test levels. The total score was used rather than subtest scores because it required fewer analyses while still providing adequate information.

The decision to use residual scores in the regression equations was based on preliminary empirical investigations indicating that the pretest scores would account for most of the variance in the posttest scores. It was clear that the pretest would be the best single predictor in the regression equations, yet its inclusion would severely limit the interpretability and usefulness of analytic results. In particular, it was feared that the strength of the pretest variable might mask the effects of other possible predictor variables. Thus, the decision was made to account for pretest effects by the use of residual scores, and to concentrate in the regression equation itself on manipulable characteristics.

Regression analysis was used to calculate the residual scores. Two regression analyses were performed at each grade level, one for each dependent variable (reading and math). The subtest scale scores from the achievement pretests were used as predictor variables, and the posttest total scale scores were used as dependent variables. The predicted posttest total scale scores resulting from these regressions were then subtracted from the corresponding actual posttest scores to produce the posttest residual scores. The residuals produced by this procedure can be considered to have had the effect of the pretest score levels totally removed. In the regression analyses to be reported, it should be remembered that only residual variance is being accounted for, and results should be interpreted accordingly.

B. METHODOLOGY

The primary statistical method employed in the overall exploratory analyses was linear multiple regression. Multiple regression techniques were chosen as the primary tool of the exploratory analyses because of their traditional role in exploratory analyses, and because of the straightforward interpretability of their results. Specifically, the results reported in this chapter were obtained by means of a stepwise multiple regression procedure designed to build the final regression equation through a series of steps, each of which adds one independent variable to the equation. The independent variable added at each step of the procedure is the one which contributes most to the predictability of the equation. The advantage of the stepwise regression is that it yields a good approximation of the "best" set of predictors.

Several cautions concerning the use and interpretation of stepwise multiple regression should be mentioned. One assumption of the multiple regression model is perfect measurement in the predictor variables, i.e., that no error of measurement exists in the data. When this condition is not met, the calculated coefficients tend to be underestimates of the parameter values; that is, the apparent contribution of a predictor variable to variance in the outcome measurement may be less than its true contribution. In the present case, since error of measurement definitely exists, the obtained regression coefficients are conservative estimates of the true values.

A second factor that may have an effect on the calculated results is the way in which missing data were handled for these analyses. The mean value of the total sample was substituted for the missing values for those variables when the mean was an interpretable statistic. This procedure tends to further reduce the magnitude of the calculated regression coefficients, and makes the estimation procedures even more conservative.

Finally, the multiple regression technique used here was a linear model, and such a model can explain only linear relationships. While linear relationships are extremely useful in summarizing data, and the largest component of most behavioral relationships is usually linear, this by no means excludes other components. In fact, there is substantial evidence that curvilinear relationships exist between the predictor variables and the criterion variable in the present data. The effect of this curvilinearity is to lower the precision of the obtained regression results. More sophisticated methods of analysis exist to deal with such situations, and these are being explored. However, it was felt that the multiple regression approach, being more intuitively meaningful and interpretable, would provide the best tool for initial exploration of the data.

To account at least in part for the non-linearity in the relationship between pretest and posttest measures, and the potential interactive effect that this non-linearity might have introduced in many of the equations, the analyses were conducted using subsets of students. Based on pretest performance, students were separated into three analysis groups, the highest-achieving 25%, the middle 50%, and the lowest 25%. This procedure made it possible to examine possible interaction effects between independent variables and initial achievement. (A variable could, for example, have a positive relationship with the outcome for the low group, no relationship for the middle group, and a negative relationship in the high group.) This subgroup analysis also provided for the fact that certain types of instructional programs or materials might not have worked equally well or in a similar manner for different kinds of students. To identify program variables that may have been important for all students, regardless of initial status, analyses were also performed on the total sample of students.

C. RESULTS OF OVERALL REGRESSION ANALYSES

The detailed results of the analyses are presented in the Appendix, Tables A-31 through A-36. These tables present, for each evaluation sample and outcome measure, a breakdown of the significant independent variables by grade level and analysis subgroup (total, high-achieving, medium-achieving, and low-achieving). The significance of a particular variable is indicated by the size of the Beta weight associated with that variable (shown in the corresponding cell of the matrix). Values are shown in the tables for all analyses in which the F-ratio was greater than 3.90 in the final regression equation. Beta coefficients are reported for these analyses, because the dependent variable was in the form of a residual score.

The discussion that follows summarizes patterns of significant relationships between independent variables and outcomes, where those patterns show some consistency across analysis groups and grade levels. Isolated cases of a significant relationship are not emphasized, since such results are too often spurious. The results are organized by the three major sample groupings (Pilot elementary sample, Basic elementary sample, and Basic secondary sample).

1. PILOT ELEMENTARY SAMPLE

The principal funding of the Pilot sample analyses was a pattern of associations between supplemental funds, the number of hours of mathematics instruction, and the reading and mathematics outcomes as measured by the achievement tests. A particularly noteworthy result was that increases in supplemental funds for reading were associated with higher test scores in both mathematics and reading. Total time devoted to mathematics instruction was negatively related to reading outcomes, but showed no relation to mathematics outcomes. The per-pupil regular funds were positively associated with reading performance at the fourth-grade level, but negatively associated across grades with mathematics performance. Higher mathematics scores were associated with lower pupil/teacher ratios and with higher total school enrollments.

No strong patterns of associations were found between the reading and mathematics outcomes and either the program or teacher characteristics used in these analyses. One student-level item, which indicated whether students felt they belonged in the school, showed a positive association with mathematics outcomes; that is, students who said they felt they belonged had higher derived mathematics scores. In addition, the Pilot sample showed associations between racial-ethnic group and reading scores; for the average and better-than-average pretest groups in the fourth and fifth grades, nonminority students scored higher than minority students. There was no association between racial/ethnic group and reading outcomes for the students in the lowest quartile on pretest performance at these two grades, and no association for any students at the third grade. Moreover, no associations between race/ethnicity and the residualized mathematics scores were found at any grade level in these Pilot samples.

2. BASIC ELEMENTARY SAMPLE

One fairly clear and potentially important pattern was found in the analyses of reading and mathematics outcomes for Basic elementary schools; this was in the relationship between achievement test scores and extent of the school activities associated with the desegregation process. For both the reading and the mathematics analyses, there was a positive relationship between the extent of these activities and the outcome variable for the third- and fourth-grade levels. At the fifth grade, there was no association between these activities and reading outcomes, and there was a negative association with the math scores.

A negative relationship was found between the extent to which comprehension skills were stressed in reading instruction, and reading scores for the average-level students. In mathematics, higher scores were associated with increased emphasis on diagnostic testing in the mathematics programs. Contrary to the results from the Pilot sample, the Basic elementary data showed a weak pattern of negative associations between school enrollment and mathematics scores; that is, larger total enrollment appeared to be associated with lower scores.

3. BASIC SECONDARY SAMPLE

The strongest and most policy-relevant relationship found in the secondary-level samples was a pattern of positive associations between the amount of time spent in reading instruction and the reading achievement scores. This pattern was strongest for the students in the lowest quartile on the pretest performance, and was evident at all three grade levels, tenth through twelfth. The second clearest pattern in these secondary grades was a positive relationship between reading outcomes and school enrollments, particularly for students who were average or above in pretest scores.

There was a moderately clear pattern of positive associations between the student's sense of control over his circumstances and his outcome scores in reading and mathematics. Students who felt their efforts would have a substantial impact on what happened to them tended to have higher residual achievement scores. This relationship was strongest for the students with poor pretest performance.

Only one pattern of associations was found between program characteristics and mathematics outcomes. This showed a negative relationship between mathematics scores and the proportion of mathematics instruction devoted to puzzle- and game-type activities.

D. IN-DEPTH STUDY OF RELATIONSHIPS BETWEEN STUDENT OUTCOMES AND DESEGREGATION ACTIVITIES

Section C, above, examined actual or hypothesized relationships between a single type of outcome measure (test performance) and a wide variety of program dimensions. One of the strongest findings, for the third and fourth grades of Basic elementary schools, was that desegregation-related school activities were positively associated with achievement test scores. This finding appeared of sufficient interest to warrant the use of further exploratory analyses, for the purpose of examining possible explanatory mechanisms underlying the apparent effects of desegregation-related activities on achievement. The present section of this chapter summarizes the methodology and results of such additional analyses, all of which centered around measures related to the desegregation objectives of the ESAA Basic program.

Results reported here are based on analyses of Basic third-grade data, because of the larger sample size at that grade level. (Only Basic programs were considered because the desegregation objectives were not pertinent to the Pilot schools. Secondary-level data were excluded because of their poor quality; it was found that many of the questions used to collect data on extent of classroom integration were inappropriate for high school classes.) Although preliminary analyses at the fourth and fifth grades indicated trends generally similar to those for the third grade, there were some differences in specific analyses. For this reason, the third-grade results reported here should not be considered totally generalizable to other grade levels.

The analyses focused on the student-level impact of school activities concerned with desegregation, and on related attitudes of school authorities. They used three indicators of the student's attitude toward education and his school as criterion variables.* The first indicator was the response to an item asking if the student felt that he or she belonged to that school. The second variable of the criterion set was a six-item composite indicating the extent to which the student expressed a liking of his school. The third indicator was a variable reflecting the student's expressed expectation of how much additional education he would obtain.

The basic rationale for these analyses was that positive feelings indicated by these criterion variables were desirable outcomes in their own right, and should be related to other desirable student outcomes, including achievement. The exploratory procedures used a three-step statistical analysis to relate the criterion variables to four other sets of indicators. The first step attempted to relate school administrative practices and actions to desegregation-related teacher attitudes. Specifically, it investigated the linear relationship between (1) a set of three indicators of teachers' attitudes toward desegregation issues and (2) another set of indicators of the actions and attitudes of school administrators.

---

*A brief description of the construction of each variable or indicator referred to in this discussion is given in the Appendix, Table A-37.

The second step was concerned with interactions between district/school variables and student interracial variables. It examined relationships between (1) the teacher-attitude indicators, plus indicators of the districts' desegregation-related activities and of principals' and superintendents' attitudes, and (2) three measures of the extent of interracial activity among the students.

The third step of the analysis dealt with possible effects of district, school, and student-level desegregation-related variables on student attitudes toward school. It investigated the relationships between (1) the criterion measures of student attitudes toward school and (2) the combined indicators of the other four sets of variables (i.e., extent of student interracial activity, teacher attitudes, principal and superintendent attitudes, and district and school desegregation-related activities). The relationship of the students' attitudes to their mathematics and reading test scores was not directly examined in this set of analyses, although it seems logical that improved attitudes might have led to improved achievement; subsequent analyses based on longitudinal data will specifically explore this premise.

1. METHODOLOGY

The statistical procedure used for the analysis reported here was canonical correlation. The canonical correlational model is a procedure for examining the relationship between two sets of variables with each set having two or more variables. Given two such sets of variables, e.g., Set A and Set B, the canonical correlation yields the linear combination of variables in Set A that produces the highest correlation with any possible linear combination of variables in Set B. The linear combinations of the variables in each set are expressed in a form like that of the standardized regression model. The correlations of these linear combinations with statistics reflecting the probabilities of such correlations, are given as outputs of the procedure. For example, in the first step of the analysis described below, one of the sets of variables included the desegregation-related actions of the school and district, the index of the superintendent's attitude toward desegregation, and the index of the principal's attitude toward desegregation. The other set of variables included the three indices of the teacher's attitude. The canonical correlational analysis yielded the coefficients of the linear combination of school actions, superintendent attitude, and principal attitude measures that had the highest correlation with any linear combination of the teacher attitude measures.

Several factors recommended the use of canonical correlations for these analyses. A first consideration involved the nature of the items and indices used. The analyses are primarily concerned with relationships among concepts that are operationally defined by the five sets of measures used. No single variable seemed to be adequate as a specification of the concepts involved, hence a model relating sets of variables was appropriate. The canonical correlation model was developed for this kind of analysis. Models involving structural equations did not appear warranted, given the absence of any strong a priori conceptual models for these data.

Since most of the items used in these analyses are defined at district, school, or teacher level, the analyses used the school as the unit of analysis.

2. RESULTS

The first step in the canonical analysis focused on relationships between (1) attitudes of the teaching staffs toward ESAA programs (i.e., desegregation-related programs), and (2) the position of the school officials as indicated by district actions and by the self-reported attitudes of administrative personnel. While no direct causal relatedness was necessarily assumed, some consistency of the teachers' attitudes with the actions and attitudes of administrators was expected. Such consistency might be the product of many factors, including, possibly, a causal impact of higher-level actions and attitudes on teachers. Conversely, the absence of such consistency might indicate a serious conflict in beliefs within the school.

Table IX-1 shows the result of the canonical correlational analvsis for three sets of variables using the aggregated school-level data from the third-grade Basic sample. This is interpreted as showing those linear composites of the two groups of variables that yielded the highest correlation. Thus, a composite school action/attitude index was obtained for each school by summing the products of the values of each variable and their appropriate factors (e.g., the value of the index of desegregation multiplied by .11, plus the percentage of minority teachers multiplied by .42, etc.). In a similar way, a composite teacher-attitude index was calculated for each school. The resulting composites were correlated with a r = 0.48.

TABLE IX-1. CANONICAL CORRELATIONS: SCHOOL ACTIONS WITH TEACHER ATTITUDES

Canonical Correlation	Chi-Square	Degrees of Freedom
.48	35.26	12
	School Actions	
	District Desegregation-Related Activities	.11
	District Percentage Minority Teachers	.42
	Superintendent Attitudes	.90
	Principal Attitudes	.24
	Teacher Attitudes	
	Teacher Attitudes: Compensatory Education	.54
	Teacher Attitudes: Cultural Enrichment	.00
	Teacher Attitudes: Integration	.61

These results show the general consistency anticipated between school actions and teacher attitudes. The relative magnitude of the coefficient within a given composite is an approximate indication of the importance of the variable in the composite. Thus the composite made up of the school actions and the principal and superintendent attitudes was dominated by the superintendent-attitude measures. The percentage of minority teachers in the district and the principal-attitude measures were of somewhat lesser importance. The variable indicating the extent of the district activities to smooth the desegregation process contributed fairly little to the composite.

High scores on the composite of teacher attitudes primarily reflected scores on the integration-desegregation index and a belief in the efficacy of the compensatory education programs. The teacher's belief in the effectiveness of cultural enrichment programs showed no contribution.

Overall, these results indicate that the major element in the consistency between the two sets of variables was the similarity of the attitude toward desegregation on the part of the teachers and the school superintendents. Similar analyses for the other elementary grade levels in the Basic schools tended to confirm this result.

The second step in the analyses was centered on the relationship between (1) the combined school staff's attitudes and actions, and (2) measures of the extent of integration of the pupils within the school settings. As in the previous step, a consistency was anticipated. More extensive and more successful integration of pupils would be expected in those schools where the staff had positive attitudes toward these outcomes.

The results of the canonical correlational analysis of these relationships are shown in Table IX-2. One set of variables was the combination of all seven measures examined in the previous analysis (i.e., the two measures of school actions, the three teacher-attitude measures, and the indices of the superintendent's and the principal's attitude toward desegregation). The other set included three indicators of the extent of inter-ethnic relationships among the students themselves. Two of these inter-ethnic measures reflected the teacher's assessment of the extent of the intergroup activity of the sample students. One measure indicated the extent of the interaction of the student with students of other ethnic groups in class discussions and projects. This measure was an indicator of the amount of such interactions in recreational activities at the school. The third measure in this set was an index of the extent of friendly interactions between Black and White students in the school as a whole. (The measure of the extent of interactions between Spanish-descent and Anglo students could not be used because it was inapplicable to more than half the sample schools.)

Both canonical variates in Table IX-2 showed some degree of bipolarity. For the composite of the measures of within-school student integration, a high score seemed to reflect increased inter-ethnic interaction in the classroom setting, and a lower score indicated more interactions in play activities. The moderate-to-high positive coefficient for the measure of Black-White interactions would seem to indicate that these interactions most often occurred in the formal classroom settings.*

TABLE IX-2. CANONICAL CORRELATIONS OF SCHOOL ACTION AND STAFF ATTITUDES WITH CLASSROOM INTEGRATION

Canonical Correlation	Chi-Square	Degrees of Freedom
0.77	103.23	21
School Actions and Staff Attitudes		
District Desegregation-Related Activities		-0.01
District Percentage Minority Teachers		-0.07
Superintendent Attitudes		0.74
Principal Attitudes		-0.24
Teacher Attitudes: Compensatory Education		0.36
Teacher Attitudes: Cultural Enrichment		0.02
Teacher Attitudes: Integration		0.08
Classroom Integration		
Student Interracial Interactions: Recreation		0.17
Student Interracial Interactions: Classroom		0.72
Black and White Student Interactions		0.56

The meaning of the composite of school actions and staff attitudes is best described by the high scores of this variate. High scores reflected pro-integration/desegregation attitudes on the part of the superintendent and a belief in the effectiveness of the compensatory programs by the teachers. The low end of this composite measure was less clearly defined, but it appeared to be associated with principal attitudes that were favorable to desegregation.

Considered together, the two canonical composites suggest that schools with relatively more intergroup activity within the formal instructional sessions tended to have a superintendent and teachers with more favorable attitudes toward integration/desegregation. In schools where the principal had relatively favorable attitudes toward desegregation, there tended to be more informal interaction among students of differing ethnic groups. It must be emphasized, however, that these canonical analyses do not necessarily show direct causal relationships. They simply demonstrate one possible set of linear associations, and do not specify the structure or direction of any interactions.

---

*The presence of this bipolar scale should not be interpreted to imply that more classroom intergroup activity means less recreational intergroup behavior and vice versa. The high positive correlation between these two measures (r = 0.85) shows this is not the case. Rather, this should be interpreted to mean that the part of these measures of intergroup activities that is accounted for by the composite is related in a bipolar manner to the composite of the other variables.

The third step of the canonical analysis focused on the degree of association between (1) a set of variables combining all the measures used in the prior two analyses, and (2) a set of three measures of the student's satisfaction with, and his expectations of, his school experiences. The first set was composed of two measures of desegregation-related school actions, measures of staff attitudes related to ESAA-type programs, and three indices of the extent of integration of students of different groups in the school activities. The composites of these variables reflected some of the major features of the school environment which formed the educational context for the student.

The second set of variables consisted of an index of the extent of additional schooling the student expected, a measure of his feeling of belonging in the school, and an index of student's liking of his school experiences. Positive values for these variables presumably reflected desirable student outcomes, and these outcomes, in turn, might logically be expected to influence and interact with other desired student outcomes, including achievement.

Table IX-3 shows that the two composite measures were highly correlated ($r = 0.90$) and that the relationship was strongly positive; that is, the major coefficients were positive. The composite of the context measures was primarily a function of the index of the teacher's belief in the value of compensatory programs, the teacher's score on the integration-desegregation index, and the extent of the integration of the students in formal classroom activities. The composite of the student variables was almost entirely a function of the measure of the student's educational expectations,with the student's liking for school contributing a very small positive component.

The results suggest that a student's educational expectations may be strongly influenced by the nature of the environment as determined by desegregation-related educational experiences. They further indicate that the teacher's attitudes may be a particularly important component of this influence. This interpretation was reinforced by similar findings for the other elementary grade levels in the Basic samples.

3. SUMMARY

The canonical correlation analyses discussed here did not directly seek to relate specific program characteristics to enhanced student achievement test performance; had achievement been included in these analyses, they would have

TABLE IX-3. CANONICAL CORRELATIONS OF SCHOOL ACTION, STAFF ATTITUDES, AND CLASSROOM INTEGRATION WITH STUDENT ATTITUDE TOWARD SCHOOL

Canonical Correlation	Chi-Square	Degrees of Freedom
0.90	144.92	30
School Actions, Staff Attitudes, and Classroom Integration		
District Desegregation-Related Activities		0.08
District Percentage Minority Teachers		0.07
Superintendent Attitudes		0.18
Principal Attitudes		0.03
Teacher Attitudes: Compensatory Education		0.60
Teacher Attitudes: Cultural Enrichment		-0.07
Teacher Attitudes: Integration		0.41
Student Interracial Interactions: Recreation		-0.21
Student Interracial Interactions: Classroom		0.32
Black and White Student Interactions		-0.11
Student Attitudes Toward School		
Students' Feeling of Belonging		0.00
Student's Liking for School		0.11
Student's Educational Expectations		0.92

been largely redundant to the overall exploratory analyses (i.e., regression analyses) reported in Section C of this chapter. Rather, the canonical analyses investigated relationships among various levels of district, school, teacher, and student activities and attitudes presumed to be related to desegregation and integration. The goal of these analyses was to seek meaningful patterns of inter-variable relationships that might suggest possible causal linkages within a sequence ultimately connecting program activities with student achievement.

In summarizing the results of the canonical correlation analyses, it should be noted that there were statistically significant and relatively consistent patterns of associations among sets of variables in each step of the analysis reported above.

Although there was no direct evidence of causality, because of the non-experimental nature of the analytic design, the results are at least suggestive that (a) positive superintendent attitudes toward desegregation were associated with positive teacher attitudes toward integration and compensatory education; (b) positive superintendent and teacher attitudes toward integration and compensatory education were associated with more frequent student interracial interactions, particularly in classroom situations; and (c) positive superintendent and teacher attitudes and frequent student interracial interactions were associated with high educational expectations on the part of students and with students' liking for school.

Should these relationships be confirmed in subsequent analyses of the second-year and third-year data, and especially should the positive student attitudes be found related to higher test achievement, these findings will have clear implications for the design and implementation of future ESAA-like programs. Specifically, they will strongly suggest that positive attitudes and activities of district/school administrators and teachers, with respect to desegregation-related issues, are important factors in promoting positive student attitudes toward school, and that these attitudes in turn favorably affect the students' cognitive achievement. Even if the final linkage between student attitudes and achievement should fail to be directly substantiated, it seems clear that more positive interactions among students of different racial/ethnic groups, and more positive feelings toward school, are important outcomes in their own right. In either event, there would appear to be suggestive evidence that ESAA-like programs should place fairly strong emphasis on activities designed to develop more positive attitudes toward desegregation within administrators and teachers.

CHAPTER X

SUMMARY OF RESULTS

Before reviewing the major findings of the report, two important facts should be noted. First, this report deals only with the first year of ESAA implementation (school year 1973-1974). Subsequent reports will describe program impact two and three years after initial implementation and cumulative impact over three school years. Second, because of difficulties in obtaining outcome data that might more directly reflect desegregation activities in the first year of the study, the present report is based on a single set of criterion measures: achievement test scores in reading and mathematics. Criterion data collected for the second and third years' evaluations will include measures of racial climate and of reduction in minority-group isolation, in addition to the achievement scores.

The remainder of this chapter first summarizes some of the more relevant characteristics of the sample districts and schools, including the racial/ethnic compositions of their staffs and student bodies, and the desegregation activities of districts having Basic programs. Descriptive data on the backgrounds and needs of sample students are then presented, followed by information on funding allocations and other program characteristics in the sample districts and schools. Finally, results of analyses of the sample students' gains in achievement test scores are summarized and interpreted.

A. CHARACTERISTICS OF SAMPLE DISTRICTS AND SCHOOLS

The first-year evaluation samples included 76 Basic elementary schools (treatment plus control), 30 Basic secondary schools, and 62 Pilot elementary schools in 80 ESAA-funded school districts. For the combined samples, over half the districts were in the Southeast and South Central regions of the country; there were no sample sites in New England or in the Western Mountain region (Colorado, Montana, etc.).

Each sample was drawn from an evaluation universe that was defined to maximize the study's ability to meet major evaluation objectives. (See Chapter I for a summary of study objectives, and Chapter II for details of the site-selection procedures.) Sampling procedures were designed to ensure that all samples were fully representative of their respective evaluation universes. Relatively little information is available concerning the extent to which the samples were representative of the total universes of Pilot and Basic ESAA awards. With respect to regional distribution, the sample districts were highly representative of the ESAA award universe. That is, the number of sample sites in different regions was strongly correlated with the number of grant awards to those regions. However, because of the emphasis on obtaining matched pairs of schools and adequate samples of students within each district, small districts tended to be eliminated; as a result, the sample districts were, on the average, larger than the universe of ESAA districts. In addition, sample Basic districts tended to have poorer matching of racial/ethnic proportions at the district, school, and class levels than the universe of districts receiving Basic grant awards.

The racial/ethnic composition of sample Pilot schools (by definition minority-isolated) showed predominant minority-student enrollment, while sample Basic schools in general were about evenly divided in overall majority/minority-group representation among students. In both Basic and Pilot schools, the percentages of minority-group teachers and administrators were consistently lower than the percentages of minority-group students. There was a better correspondence between staff racial/ethnic composition and student body racial/ethnic composition in sample Pilot programs than in the Basic programs.

There was a considerably higher average percentage of economically disadvantaged students (defined in terms of eligibility for participation in Title I programs) in sample Pilot schools (59%) than in sample Basic elementary (39%) and secondary (30%) schools. Community involvement, as indicated by the percentage of paid paraprofessional and clerical staff drawn from community resources, was greater in Pilot and Basic elementary schools than in Basic secondary schools.

Decision-making within the sample districts was relatively decentralized for decisions concerning classroom curricula and media; parents and students, as well as teachers and administrators, reportedly participated in such decisions in a fifth of the elementary schools and half the secondary schools. Decisions concerning budget expenditures were typically shared by a considerably more exclusive group, with very little parent or student involvement. Finally, personnel decisions were usually limited to participation by district and school administrators.

Elements of district desegregation plans most frequently reported by superintendents in the Basic sample districts were bussing of students from other areas and drawing of new school boundaries to provide for desegregation. Assignment of pupils by geographic attendance area was more likely to occur in districts characterized by moderate or high percentages of minority students. Bussing of students to achieve greater racial balance was more likely to occur in districts that had small percentages of minority students or small total-enrollment sizes. There was also some evidence that bussing was associated with districts that had greater racial balance (higher Desegregation Index values). In those districts that used bussing, it appears that larger percentages of minority students than non-minority students were bussed.

Overall, the amount of desegregation that took place during ESAA Year I was small; this was not unexpected, since most of the Basic award districts had been desegregating their school systems for two or more years prior to the creation of the ESAA program. However, 20% of the sample districts did achieve relatively large reductions in minority-group isolation during the evaluation year.

Treatment-control comparisons within the Pilot and Basic sample groups showed virtually no differences in any sociodemographic dimension, indicating considerable success of the evaluation in randomizing treatment and control school assignments to meet the experimental condition of the sampling design.

B. STUDENT BACKGROUNDS AND NEEDS

Sample students were almost evenly divided between males and females. Within the Pilot sample, approximately 68% of the students were categorized as Black by their teachers, 15% were of Spanish background, and about 13% were White. In the Basic elementary sample, roughly 44% of the students were Black, 8% of Spanish background, and 45% White. Of the Basic secondary students, 45% were Black, 54% were White, and only .6% were of Spanish background. The small percentage of Spanish-background students at the secondary level may, in part, reflect a higher dropout rate among that group in high school; in addition, the sample did not include any large districts in areas of the country with sizable proportions of Spanish-background students.

The academic needs of the sample students were clearly evidenced by their pretest performance on the achievement tests in reading and mathematics. Though performance varied somewhat across grade levels and across evaluation samples, all of the mean scores were well below the 50th percentile, with the bulk lying between the 16th and 37th percentiles. Reading vocabulary and mathematics concepts were particularly weak areas for the sample students in both Basic and Pilot programs. These results appear to indicate that the ESAA grant award process led to selection of needy districts and schools, and that the schools selected needy students to participate in the local ESAA programs. It was impossible to determine, however, whether the selected schools and students were the most needy in the participating districts.

Most sample students were also socioeconomically disadvantaged. Fewer than half of the students' parents were reported to have completed high school, and a large percentage of parents had unskilled jobs. On the average, families of minority students were more disadvantaged than those of nonminority students.

Because of the random selection procedures used to select students, the samples of students can be assumed representative of ESAA-eligible students in the selected grade levels in the sample schools. Treatment and control groups were quite effectively matched, as evidenced by the almost total absence of significant differences between those groups on demographic variables or on pretest scores.

C. PROGRAM CHARACTERISTICS

Particular emphasis was placed on funding allocations of the school programs because of the importance of expenditure data in the design of the evaluation. Information was collected on all expenditures in both treatment and control schools, since analyses of ESAA expenditures alone would be meaningless without knowledge of the total budgetary context.

Sample districts had average total per-pupil expenditures of $1,343, and average supplemental per-pupil allocations of $460. At the school level, the average per-pupil total expenditures were $1,031 for the Pilot sample, $994 for Basic elementary schools, and $879 for Basic secondary schools. The total supplemental funding levels were $238 per pupil for the Pilot sample, $120 for the Basic elementary sample, and $32 for the Basic secondary sample.

ESAA funding, a key variable in this study, ranged from a high of $231 per pupil for the Pilot treatment schools to a low of $60 per pupil in the Basic secondary treatment schools. The pattern of allocation of ESAA funds within schools was somewhat different than that of non-ESAA supplemental funds. At the elementary level, a larger portion of ESAA money than of other supplemental money was used for a cluster of activities that included counseling and guidance, community activities, intercultural relations programs, etc. In contrast, non-ESAA supplementary funds were focused more heavily than ESAA funds on reading activities. At the secondary level, ESAA funds were concentrated more heavily (relative to non-ESAA funds) on reading, and non-ESAA funds emphasized mathematics more strongly.

Local Pilot programs were supposed to focus entirely on improvement of basic skills, and approximately two-thirds of the Pilot funds overall were reportedly spent on activities directly addressing that objective. The remaining third of the funds were committed to a variety of supportive activities such as individual and group counseling and guidance of students, new curriculum development, community activities, and administrative costs. More detailed study is needed to determine the degree of relevance of those supportive activities to improvement of basic skills. In Basic elementary and secondary schools the allocation of funds across the three major application areas (reading, mathematics, and "other" activities including desegregation-related activities) appears reasonable in light of the Basic program's Congressional mandate to pursue desegregation-related goals as well as basic skills improvement.

A fundamental premise of the evaluation's experimental design was that a treatment school's ESAA funding would constitute an increment over and above the funding level of a matched control school. The validity of this premise was examined by the use of paired t-tests on the total per-pupil supplemental funding levels. (It was assumed that regular funding was constant across schools within a district, and thus the only variability in total funding would be in the supplemental funding.)

A statistically significant funding difference in favor of the treatment schools was found for the Basic elementary and Basic secondary samples, but not for the Pilot sample. Only about a third of the Basic treatment schools had a per-pupil funding level exceeding the level in the matched control schools by more than 5%. Though the educational interpretation of this level of funding increment is highly judgmental, it is certainly not clear that a 5% differential should be expected to bring dramatic changes in student achievement.

Patterns of supplemental fund allocation were compared for the treatment and control groups. At the elementary-school level, the percentages of funds allocated to the reading, mathematics, and "other" categories (e.g., counseling, intercultural activities) were similar for the treatment and control groups.

For both groups, funds were focused most heavily in the reading area. At the secondary level, the treatment schools placed heavier concentration of funds in reading, while the control schools placed more funds in the "other" area.

Presumably the effectiveness of ESAA funds or of any other school funds depends on how those funds are applied to resources, and on the goals and operating characteristics of the school programs. Data on these program characteristics were collected for both treatment and control schools, and for both regular and remedial instruction.

Within the sample elementary schools, inservice training was most heavily focused on reading, with about 50% of the sample teachers participating. Training in the instruction of the disadvantaged had the lowest rate of teacher participation (about 20%). Basic secondary schools reported less inservice training overall than elementary schools, but placed proportionately greater emphasis on training associated with intergroup relations.

At the elementary school level, most teachers had the bachelor's degree, and from 14% to 26% (depending on the subsample) had master's degrees. In sample secondary schools, almost half of the teachers had advanced degrees. The percentages of minority staff members were consistently lower than the corresponding percentages of minority students.

In sample elementary schools, remedial reading teachers were more frequently available than any other type of specialized support staff, while at the secondary level, the relatively small number of remedial teachers was evenly divided between the reading and math areas. Aides were more frequently available in Pilot programs than in Basic programs.

By far, the majority of treatment-control comparisons showed no significant differences in availability of resources. The more important exceptions to this rule were that (a) in the Basic elementary sample, treatment schools had greater availability of inservice training and of teacher aides for reading and math instruction, and (b) in the Basic secondary sample, more treatment group teachers than control group teachers participated in intercultural training sessions.

More detailed data were collected on specific characteristics of the reading and math programs, with particular emphasis on the amount of student exposure to different types of instruction. Sample Pilot students received slightly greater average total weekly exposure in reading instruction (11.4 hours) than sample Basic elementary students (10.3 hours). Exposure to math instruction was similar for the Pilot (8.1 hours) and Basic elementary samples (8.0 hours). At the secondary level, total weekly exposure to reading instruction was 8.1 hours, and exposure to math activities was 5.7 hours.

Regular reading programs emphasized objectives related to improving comprehension skills and basic word techniques; remedial reading programs stressed those same skills but also focused heavily on development of sensory-perceptual motor skills. Both regular and remedial math programs emphasized objectives in math concepts and operations, and gave considerable priority to efforts to increase student motivation to learn math.

The size of most regular elementary-level instructional classes in reading and math ranged from 21 to 25 students; at the secondary level, the classes were slightly larger. Remedial classes were somewhat smaller (16 to 20 students), and there was greater emphasis on individualized instruction.

Treatment-control comparisons were made on a large number of variables related to the reading and math instruction, and in most instances no significant differences were found. One exception, however, was that in sample Pilot programs, treatment students spent a larger percentage of their time than control students being tutored by an older person. Also, in sample Basic elementary programs, instructional class size was significantly smaller in treatment schools than in control schools.

Many of the sample schools reported some form of intercultural and counseling activities. In both Pilot and Basic elementary sample schools, the heaviest concentration was on cultural enrichment programs, followed by field trips and group counseling activities. At the secondary level, there was heavy emphasis on field trips and individual and group counseling, followed by cultural enrichment and interracial programs.

Within sample elementary schools receiving ESAA funds, a consistent relationship was found between students' pretest scores on the achievement subtests and amount of exposure given to the students in different areas of academic content. This relationship indicated that, at least at a gross level, the ESAA programs were appropriately focusing their instructional efforts in the areas of greatest student needs.

D. STUDENT GAINS IN ACHIEVEMENT TEST SCORES

Two sets of analyses were performed to assess the overall gains of students in the evaluation samples. First, test scores of the paired treatment (ESAA-funded) and control (non-ESAA) schools were compared, in an attempt to identify possible differential effects of the ESAA funding. Second, the test scores of the total evaluation samples (combined treatment and control schools) were examined to determine whether the overall pretest-posttest gains were greater than might have been predicted on the basis of prior normative data.

With respect to the treatment-control comparisons, no evidence was found of overall differences in achievement test scores. Such an outcome was not surprising, in view of the brief span of program operation; the average pretest-posttest interval was only slightly more than five months, and many of the programs had just barely become operational at pretest time. Furthermore--and perhaps in part reflecting the early formative stage of the ESAA programs--there were few differences in the treatment and control programs themselves that might have led to an expectation of significant outcome differences. Treatment-control differences in total per-pupil funding were not significant in the Pilot sample; while statistically significant in the Basic samples, the actual amount of the funding difference exceeded 5% of the control-school allocations in only about a third of the sample districts. Finally, although significant treatment-control differences were found in a few dimensions of the schools' operational programs, these were few in number considering the many different combinations of variables on which comparisons were made. In short, there was little evidence, overall, that the treatment schools were markedly different than their paired control schools.

In the analyses of achievement test gains in the combined treatment and control schools, the results were encouraging, but difficult to interpret. "Expected" gains were defined according to three different criteria. One criterion represented the gain necessary for a student who scored at the median (50th percentile) on the pretest to maintain that same relative position on the posttest; determination of this criterion gain was based on the test publisher's national norms for a sample of the general population of students at the grade levels of interest. The second criterion, also based on the publisher's national normative data, represented the gain necessary for each student in the ESAA evaluation sample to maintain his same relative position (whatever that was) from pretest to posttest. The third criterion attempted to take into account the tendency of disadvantaged students to gain in achievement at slower rates than the general population as a whole. To define this third criterion, empirical data from the earlier restandardization testing were used to establish overall growth rates for disadvantaged students (as defined by the restandardization sample of ESAA-eligible students); those rate values were then used as scale factors in a downward adjustment of the gains required to meet criterion (i.e., to maintain a median position).

These three criteria represent somewhat different levels of difficulty, with the first criterion (maintaining the 50th percentile) being generally the most stringent because it is based on the overall population of students rather than on a subsample of disadvantaged students. The use of the three criteria is extremely speculative, as it involves unsubstantiated assumptions concerning the shape of the growth curves within and across school years. Thus, any results from analyses using the criteria must be interpreted with extreme caution, and should be regarded only as suggestive of general trends. Given these constraints, the analyses (which used Bayesian techniques to allow individual program comparisons) appear to indicate that the sample students (treatment plus control) overall made gains at least as large as might have been "expected" on the basis of the two "disadvantaged" criteria (second and third criteria), and for some conditions approached the more demanding 50th-percentile criterion. The numbers of schools reaching or exceeding criterion varied with the achievement subtest involved as well as with the specific gain criterion used. At the elementary level overall, much larger gains were made (i.e., larger numbers of schools met the criteria) in math than in reading. Basic schools tended to make larger gains than Pilot schools, but the differences were not dramatic. In the reading area, greater gains were made in comprehension than in vocabulary.

Additional analyses were performed examining gains aggregated across all schools rather than by matched pairs of schools; these analyses did not use Bayesian techniques but simply compared the observed and "expected" gains. Results were quite consistent with those of the Bayesian analyses, and again indicated that gains were generally larger than anticipated for disadvantaged students.

How should the results of the analyses of overall gains (in treatment plus control schools) be interpreted? One possible inference is that the ESAA funds, added to the general pool of dollars available to the sample districts, allowed the districts to increase the total supplemental budgets of control schools as well as treatment schools (e.g., by giving more of the Title I funds to the control schools), and thereby helped to enhance achievement in both treatment and control schools. However, another tenable inference is that the results of the Bayesian analyses are artifacts of sampling or measurement errors, or simply reflect the use of unwarranted assumptions about the shapes of "expected" learning curves. The first-year data simply do not provide a suitable basis for moving beyond the conjectural stage with respect to the overall gains of the evaluation sample. It is hoped that later analyses of the second and third years' data will help at least to eliminate some of the alternative explanations, assuming that the same general pattern of results is found.

E. RELATIONSHIPS AMONG ACHIEVEMENT SCORES, STUDENT VARIABLES, AND PROGRAM VARIABLES

Linear regression analyses were performed to explore relationships among student characteristics, staff and program characteristics, and achievement test scores. Before summarizing the more interesting results of these analyses, it is important to stress certain limitations in the analytic design that affect the interpretation of the findings. First, the regression analyses were not based on a true experimental design. Neither schools nor students were randomly assigned to the different treatment conditions being compared. As a consequence, it is quite possible that observed relationships may be artifacts of the samples involved in these analyses. For example, if program trait "X" were found associated with higher reading scores, this might simply reflect the fact that, coincidentally, schools with trait "X" also had students who received more home support for their reading studies.

The second constraint on interpretation of the regression analyses results is that nothing in these analyses can be interpreted as evidence of causal relationships between program variables and achievement test measures. The analyses yield estimates of the degree of association among variables, but they do not provide any information about whether changes in one set of variables (e.g., instructional procedures) cause changes in another set (achievement test scores).

Finally, in no case was a relationship found statistically significant at all grade levels and for all test measures; however, the results summarized below involve relationships that were found across enough different grade levels and test criterion measures to be interpretable as showing some moderately consistent trend. For summarization purposes the general trends are described below, but readers must refer to the more detailed discussions in the earlier chapters to ascertain the breadth and consistency of those trends.

Turning now to the results of the regression analyses, one finding of interest in the Pilot elementary sample was a positive relationship between level of supplemental funding for reading instruction and achievement scores in both reading and mathematics. One possible interpretation of this finding is that a greater focus of supplemental funds on reading instruction had beneficial effects that generalized over both reading and mathematics achievement gains.

Such a generalization to mathematics would not be surprising, since mathematics instruction is heavily dependent on the students' mastery of language skills.

Should this causal interpretation be valid, there would seem to be clear policy implications for future ESAA and ESAA-like programs conducted in the context of minority-isolated elementary schools: where the improvement of academic test performance is an important program goal, supplemental funding should be heavily focused on the improvement of reading instruction. As implied by the general caution given above, however, there is no empirical data for inferring a causal relationship between funding level for reading instruction and test performance.

A second finding, again in the Pilot elementary sample, was that lower pupil/teacher ratios and higher total school enrollments were associated with higher mathematics test scores. If one were to assume an underlying causal relationship, the fact that pupil/teacher ratio and size of school enrollment "affected" only mathematics test scores could be explained on the theory that mathematics scores were potentially more sensitive to differences in program approaches than reading scores. Reading scores are known to be heavily influenced by students' experiences outside the classroom, whereas mathematics scores have typically been found more responsive to variations in the formal classroom instruction. Again, however, there was no direct evidence of causality, and the relationship found here could easily be "explained" by a large number of alternative interpretations.

In Basic elementary schools where, unlike the Pilot schools, a major program goal was the improvement of interracial relations, certain program characteristics related to desegregation were found associated with achievement scores. At the third and fourth grades, schools that had a higher frequency of school activities related to the desegregation process (e.g., frequency of public meetings, media presentations, and staff meetings concerned with interracial interactions) also tended to have higher achievement scores in both reading and mathematics. This finding is of special interest because of its parallel to certain findings in a previous study of the Emergency School Assistance Program (ESAP).* In that study, which dealt with a program quite similar to ESAA, certain indicators of positive racial atmosphere in the schools were positively associated with achievement gains at both the fifth and tenth grades. A relationship was also found in the ESAP evaluation between school integration (as measured by racial composition within schools) and achievement scores. Thus, both studies seem to suggest that some form of relationship exists between variables associated with integration and racial attitudes, and student achievement test scores--but in neither study was there any direct basis for interpreting the causal nature of that association.

Another finding in the Basic elementary sample was a positive relationship in some of the subsamples between the frequency of diagnostic testing by the teacher and the students' achievement test gains in mathematics. This relationship, though neither as strong nor as consistent as those described above, is of interest because it was one of the few associations of even moderate strength involving specific instructional techniques. One may speculate that the more frequent use of diagnostic tests enabled teachers to pinpoint learning deficiencies of students and thereby to remedy these deficiencies more effectively. Should this finding be substantiated in some future study under more experimentally-controlled conditions, it would argue strongly that ESAA-like programs should establish guidelines and train teachers to make frequent and systematic use of diagnostic tests.

---

*The National Opinion Research Center. Southern Schools: An Evaluation of the Effects of the Emergency School Assistance Program and of School Desegregation. University of Chicago.

The strongest relationship found in Basic secondary schools was a pattern of positive associations between the amount of time spent in reading instruction and the reading achievement scores. This pattern was strongest for students in the lowest quartile on pretest performance, and was evident in all three grade levels, tenth through twelfth. Given the usual caveats concerning attributions of causality in purely associative analyses, this finding seems to suggest that greater student exposure to reading activities may have led to enhanced reading performance. Should a causal relationship be demonstrated in future studies, this unsurprising finding would clearly support a recommendation that programs provide as much student exposure as possible to reading instruction.

F. RELATIONSHIPS BETWEEN STAFFS' DESEGREGATION-RELATED ATTITUDES AND STUDENT ATTITUDES

As a result of the observed relationship between desegregation-related school activities and achievement scores in the Basic elementary sample, additional exploratory analyses were performed to examine the relationship between desegregation-related activities and attitudes at the classroom, school, and district levels, and student attitudes toward education and school. Canonical correlation methods were used to examine the degree of association among sets of variables at three conceptual stages in the tracing of the influence of desegregation-related attitudes and activities. At the first stage, favorable actions and attitudes of district administrators toward desegregation were found associated with positive (pro-integration) teacher attitudes on desegregation-related issues. In the second stage of analysis, a greater degree of positive interracial activity among students was found in districts and schools that had favorable teacher and superintendent attitudes toward integration and greater frequency of desegregation-related district activities. Finally, in the third stage, more positive attitudes toward school and toward their own educational futures were found in students in schools with greater amounts of student interracial activity, more positive teacher and superintendent attitudes on desegregation issues, and more frequent desegregation-related district and school activities. The overall pattern of these analyses suggests strong contextual effects of attitudes and activities related to desegregation in the classroom and school on the attitudes and expectations of students. Students' educational expectations, in particular, may be strongly influenced by the nature of the educational environment, and teachers' attitudes may be a particularly important component of this environment. Although a linkage between positive student attitudes and enhanced academic achievement might reasonably be hypothesized, such a linkage was not directly tested in this series of analyses.

The discovery of strong relationships at each stage of these analyses does not provide evidence of causality; however, it does suggest important relationships between attitudes of administrators and teachers, between actions at the school and district level and student racial interactions, and between all of these variables and student attitudes. Should these relationships be confirmed in subsequent analyses of second- and third-year data, they will have important implications for policy-makers attempting to effect changes in student attitudes. While positive student attitudes constitute an important outcome in themselves, subsequent analyses will explore the influence of these attitudes on student achievement scores.

APPENDIX A

ADDITIONAL TABLES BASED ON 1973-1974 DATA

TABLE A-1. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR THIRD-GRADE PILOT STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 2	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	X	S.D.	Range		
Reading Vocabulary	40	315.836	48.428	160-471	23	2.1
Reading Comprehension	45	327.354	53.069	177-558	23	2.2
READING TOTAL	85	302.752	53.129	125-525	20	2.1
Math Computation	72	267.989	34.942	173-422	17	2.2
Math Concepts	30	295.184	44.568	164-466	13	1.8
MATH TOTAL	102	281.495	32.236	159-450	14	2.1

TABLE A-2. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR FOURTH-GRADE PILOT STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 3	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
Reading Vocabulary	40	328.013	53.988	178-600	16	2.4
Reading Comprehension	45	353.405	60.604	184-675	18	2.7
READING TOTAL	85	320.602	55.686	148-646	16	2.5
Math Computation	72	306.367	45.928	169-464	18	3.1
Math Concepts	30	316.573	52.671	184-561	12	2.3
MATH TOTAL	102	311.291	44.588	167-486	14	2.8

TABLE A-3. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR FIFTH-GRADE PILOT STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 3	SCALE				Percentile for $\bar{X}$	G.E. for $\bar{X}$
	No. of Items	$\bar{X}$	S.D.	Range		
Reading Vocabulary	40	361.964	57.151	178-544	19	3.2
Reading Comprehension	42	388.912	61.707	184-604	21	3.4
READING TOTAL	82	359.418	59.959	148-556	19	3.3
Math Computation	48	347.532	57.981	169-626	21	4.0
Math Concepts	25	350.224	63.508	184-585	16	3.1
MATH TOTAL	73	348.694	52.743	167-606	17	3.8

TABLE A-4. PRETEST ACHIEVEMENT LEVEL (STANDARD SCORES) FOR THIRD-GRADE BASIC STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 2	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
Reading Vocabulary	40	300.895	50.603	160-471	36	2.6
Reading Comprehension	45	350.190	60.534	177-570	37	2.7
READING TOTAL	85	326.831	56.614	125-525	35	2.6
Math Computation	72	277.215	38.184	173-449	23	2.4
Math Concepts	30	315.575	50.468	164-475	25	2.3
MATH TOTAL	102	293.096	36.040	159-469	22	2.4

TABLE A-5. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR FOURTH-GRADE BASIC STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 3	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
Reading Vocabulary	40	351.629	61.749	178-571	28	3.0
Reading Comprehension	42	365.407	65.021	184-651	31	3.2
READING TOTAL	82	346.813	64.398	148-608	28	3.1
Math Computation	48	316.716	50.132	169-527	24	3.3
Math Concepts	25	338.587	60.754	184-598	21	2.8
MATH TOTAL	73	325.663	49.785	167-517	21	3.2

TABLE A-6. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR FIFTH-GRADE BASIC STUDENTS

CALIFORNIA ACHIEVEMENT TEST LEVEL 3	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
Reading Vocabulary	40	386.460	64.324	178-601	31	4.0
Reading Comprehension	42	411.249	67.993	184-682	32	4.1
READING TOTAL	82	385.342	67.042	148-665	29	4.0
Math Computation	48	362.488	62.271	169-592	28	4.3
Math Concepts	25	376.826	64.739	184-626	28	4.0
MATH TOTAL	73	366.797	56.749	167-586	27	4.2

TABLE A-7. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR TENTH-GRADE BASIC STUDENTS

TEST	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
IOWA SILENT READING TEST--LEVEL 2						
Reading Vocabulary	50	136.030	29.444	0-225	32	--
Reading Comprehension	50	133.904	31.100	0-256	33	--
READING TOTAL	100	133.932	31.122	0-254	30	--
CALIFORNIA ACHIEVEMENT TEST MATH--LEVEL 5						
Math Concepts	35	517.924	117.966	199-902	24	8.1
Math Computation	48	502.129	115.013	200-857	22	7.6
Math Problems	15	502.574	106.681	299-867	22	7.6
MATH TOTAL	98	505.431	108.621	185-901	23	7.9

TABLE A-8. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR ELEVENTH-GRADE BASIC STUDENTS

TEST	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
IOWA SILENT READING TEST--LEVEL 2						
Reading Vocabulary	50	143.713	30.889	0-225	33	--
Reading Comprehension	50	140.763	31.937	0-256	33	--
READING TOTAL	100	141.700	32.106	0-254	32	--
CALIFORNIA ACHIEVEMENT TEST MATH--LEVEL 5						
Math Concepts	35	532.370	131.769	199-908	23	8.4
Math Computation	48	521.762	124.455	200-857	21	8.2
Math Problems	15	522.018	116.077	299-867	20	8.1
MATH TOTAL	98	523.197	121.162	185-928	21	8.3

TABLE A-9. PRETEST ACHIEVEMENT LEVELS (STANDARD SCORES) FOR TWELFTH-GRADE BASIC STUDENTS

TEST	SCALE				Percentile for $\overline{X}$	G.E. for $\overline{X}$
	No. of Items	$\overline{X}$	S.D.	Range		
IOWA SILENT READING TEST--LEVEL 2						
Reading Vocabulary	50	151.803	32.307	0-225	34	--
Reading Comprehension	50	148.216	32.030	0-256	36	--
READING TOTAL	100	150.027	33.747	0-247	34	--
CALIFORNIA ACHIEVEMENT TEST MATH--LEVEL 5						
Math Concepts	35	539.993	142.651	199-908	24	8.6
Math Computation	48	531.117	133.154	200-857	29	8.4
Math Problems	15	537.277	127.851	299-867	19	8.6
MATH TOTAL	98	532.711	133.187	185-908	21	8.6

TABLE A-10. AVERAGE WEEKLY PERCENTAGE OF TOTAL READING EXPOSURE SPENT IN INDIVIDUAL READING ACTIVITIES IN PILOT SAMPLE SCHOOLS

Activity	Treatment (Total N = 14)		Control (Total N = 14)		Unpaired Treatment (Total N = 14)	
Total Weekly Reading Exposure (in hours)	$\bar{X}$ 11.56	S.D. 3.51	$\bar{X}$ 11.51	S.D. 3.13	$\bar{X}$ 11.11	S.D. 1.99
Component Activities	$\bar{\%}$	S.D.	$\bar{\%}$	S.D.	$\bar{\%}$	S.D.
Group Instruction	22.9	7.1	24.9	9.3	24.9	6.2
Tutoring by Older Person	8.0*	3.8	5.3	3.2	7.6	3.1
Peer Tutoring	3.4	2.4	3.5	1.9	2.8	1.7
Machine-Mediated Instruction	5.4	4.1	5.8	2.4	6.6	3.2
Games/Contests	5.8	3.4	6.4	2.4	6.4	2.2
Diagnostic (Test Taking)	5.1	1.7	5.1	2.2	5.8	1.6
Independent Seat Exercises	18.6	6.4	19.0	4.6	18.8	4.4
Report/Story Writing	6.5	2.8	6.4	1.9	[illegible]	2.8
Individualized Reading	15.7	9.1	14.2	4.9	13.2	3.2
Student Presentation	3.5	3.3	4.3	2.2	3.1	1.4
"Pullout" Compensatory Reading	5.3	4.2	6.2	5.9	5.7	4.6

*Treatment group mean is significantly higher ($\alpha = .05$).

TABLE A-11. AVERAGE WEEKLY PERCENTAGE OF TOTAL READING EXPOSURE SPENT IN INDIVIDUAL READING ACTIVITIES IN BASIC ELEMENTARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 33)		Control (Total N = 33)	
Total Weekly Reading Exposure (in hours)	$\overline{X}$	S.D.	$\overline{X}$	S.D.
	10.67	2.53	9.84	2.25
Component Activities	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Group Instruction	22.5	7.4	26.1	6.0
Tutoring by Older Person	6.0	4.1	5.0	2.8
Peer Tutoring	2.7	1.7	3.1	2.2
Machine-Mediated Instruction	6.3	3.7	5.0	2.3
Games/Contests	5.9	2.6	5.3	2.2
Diagnostic (Test Taking)	6.0	3.0	5.8	2.1
Independent Seat Exercises	19.5	4.4	21.3*	5.1
Report/Story Writing	5.8	2.4	6.1	2.5
Individualized Reading	15.4	5.1	13.8	4.8
Student Presentation	3.2	2.0	3.7	1.9
"Pullout" Compensatory Reading	6.9	6.7	5.8	5.0

*Control group mean is significantly higher ($\alpha = .05$)

TABLE A-12. AVERAGE WEEKLY PERCENTAGE OF TOTAL READING EXPOSURE SPENT IN INDIVIDUAL READING ACTIVITIES IN BASIC SECONDARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 11)		Control (Total N = 11)	
Total Weekly Reading Exposure (in hours)	$\overline{X}$ 8.24	S.D. 1.12	$\overline{X}$ 7.81	S.D. 7.81
Component Activities	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Group Instruction	17.7	3.4	16.4	4.4
Tutoring by Older Person	4.9	2.3	5.0	2.2
Peer Tutoring	2.2	1.2	2.4	0.9
Machine-Mediated Instruction	3.1	1.4	3.2	1.3
Games/Contests	5.3	2.4	5.7	2.3
Diagnostic (Test Taking)	10.4	2.5	9.8	1.7
Independent Seat Exercises	14.2	1.7	13.6	2.3
Report/Story Writing	12.2	3.5	13.3	2.3
Individualized Reading	19.3	4.1	12.3	6.5
Student Presentation	5.9	2.2	6.8	1.5
"Pullout" Compensatory Reading	5.0	6.1	3.2	0.8

TABLE A-13. AVERAGE WEEKLY PERCENT OF TOTAL MATH EXPOSURE SPENT IN INDIVIDUAL MATH ACTIVITIES IN PILOT SAMPLE SCHOOLS

Activity	Treatment (Total N = 14)			Control (Total N = 14)			Unpaired Treatment (Total N = 14)		
Total Weekly Math Exposure (in hours)	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N
	7.76	3.75	14	8.30	4.21	14	8.14	2.96	14
Component Activities	$\overline{\%}$	S.D.		$\overline{\%}$	S.D.		$\overline{\%}$	S.D.	
Group Instruction	29.9	1.11		28.0	1.11		25.4	10.8	
Tutoring by Older Person	8.8*	5.9		4.8	3.7		9.1	4.6	
Peer Tutoring	4.8	3.5		3.6	3.2		3.7	2.3	
Machine-Mediated Instruction	3.9	3.8		4.7	4.2		5.3	3.3	
Games/Contests	8.7	3.2		8.3	3.9		9.3	4.4	
Diagnostic (Test Taking)	8.0	2.8		7.6	4.3		8.0	4.1	
Independent Seat Exercises	26.7	1.3		22.1	9.4		21.2	7.8	
Report Writing	2.6	2.5		3.0	3.7		1.0	1.0	
Student Presentation	3.4	3.3		5.9**	4.5		4.0	3.1	
"Pullout" Compensatory Math	2.7	3.7		5.7	7.0		6.0	6.2	

*Treatment group mean is significantly higher ($\alpha = .05$).

**Control group mean is significantly higher ($\alpha = .05$).

TABLE A-14. AVERAGE WEEKLY PERCENT OF TOTAL MATH EXPOSURE SPENT IN INDIVIDUAL MATH ACTIVITIES IN BASIC ELEMENTARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 33)		Control (Total N = 33)	
Total Weekly Math Exposure (in hours)	$\overline{X}$ 8.27	S.D. 2.79	$\overline{X}$ 7.77	S.D. 2.75
Component Activities	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Group Instruction	28.3	8.7	30.0	7.9
Tutoring by Older Person	8.0	4.6	6.1	4.0
Peer Tutoring	4.3	2.8	4.6	3.1
Machine-Mediated Instruction	5.1	3.9	4.5	3.1
Games/Contests	9.0	3.3	8.5	2.6
Diagnostic (Test Taking)	8.3	3.4	8.8	3.0
Independent Seat Exercises	27.4	7.2	30.4**	7.7
Report Writing	1.4	1.3	1.2	1.1
Student Presentation	3.8	3.1	3.3	2.4
"Pullout" Compensatory Math	4.4*	4.6	1.9	2.8

*Treatment group mean is significantly higher ($\alpha = .05$).

**Control group mean is significantly higher ($\alpha = .05$).

TABLE A-15. AVERAGE WEEKLY PERCENT OF TOTAL MATH EXPOSURE SPENT IN INDIVIDUAL MATH ACTIVITIES IN BASIC SECONDARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 11)		Control (Total N = 11)	
Total Weekly Math Exposure (in hours)	$\overline{X}$ 5.84	S.D. 1.16	$\overline{X}$ 5.51	S.D. 9.7
Component Activities	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Group Instruction	24.6	6.3	25.8	7.8
Tutoring by Older Person	8.4	3.3	9.0	2.2
Peer Tutoring	3.5	1.4	3.9	1.0
Machine-Mediated Instruction	3.7	1.6	4.4	2.1
Games/Contests	6.3	2.9	6.4	2.2
Diagnostic (Test Taking)	14.5	4.2	14.6	3.4
Independent Seat Exercises	21.1	4.3	21.5	4.2
Report Writing	4.7	2.4	5.8	3.5
Student Presentation	6.2	2.6	5.4	2.4
"Pullout" Compensatory Math	7.0	1.2	3.4	1.1

TABLE A-16. AVERAGE WEEKLY PERCENTAGE OF TOTAL INTERCULTURAL AND COUNSELING EXPOSURE SPENT IN INDIVIDUAL ACTIVITIES IN PILOT SAMPLE SCHOOLS

Activity	Treatment (Total N = 14)		Control (Total N = 14)		Unpaired Treatment (Total N = 14)	
Average Total Weekly Intergroup Exposure (in hours)	$\bar{X}$ 2.48	S.D. 2.35	$\bar{X}$ 2.32	S.D. 1.35	$\bar{X}$ 1.78	S.D. 1.21
Component Activities	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.	$\overline{\%}$	S.D.
Field Trips	28.8	2.61	19.7	2.10	17.4	16.1
Interracial Programs or Projects with Other Schools	4.3	5.2	2.3	2.5	3.8	5.2
Cultural Enrichment Programs	35.8	20.2	28.5	16.0	34.6	20.9
ESL or Bilingual Activities	8.2	15.2	9.2	11.3	8.7	17.2
Group Counseling/ Guidance	13.5	13.8	20.0	18.5	19.4	18.5
Individual Counseling/ Guidance	9.4	11.5	13.4*	10.4	8.8	10.6

*Control group mean is significantly higher ($\alpha = .05$).

TABLE A-17. AVERAGE WEEKLY PERCENTAGE OF TOTAL INTERCULTURAL AND COUNSELING EXPOSURE SPENT IN INDIVIDUAL ACTIVITIES IN BASIC ELEMENTARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 33)			Control (Total N = 33)		
Total Weekly Intergroup Exposure (in hours)	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N
	2.23	1.08	33	1.85	1.53	33
Component Activities	$\overline{\%}$	S.D.		$\overline{\%}$	S.D.	
Field Trips	16.6	1.69		16.3	1.38	
Interracial Programs or Projects with Other Schools	4.1	4.6		4.9	5.0	
Cultural Enrichment Programs	39.0	2.3		41.8	2.1	
ESL or Bilingual Activities	5.1	8.6		5.1	1.19	
Group Counseling/Guidance	20.3	1.49		20.1	1.59	
Individual Counseling/Guidance	15.1	1.41		11.8	1.10	

TABLE A-18. AVERAGE WEEKLY PERCENTAGE OF TOTAL INTERCULTURAL AND COUNSELING EXPOSURE SPENT IN INDIVIDUAL ACTIVITIES IN BASIC SECONDARY SAMPLE SCHOOLS

Activity	Treatment (Total N = 33)			Control (Total N = 33)		
Total Weekly Intergroup Exposure (in hours)	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N
	2.33	5.8	10	2.45	5.7	10
Component Activities	$\overline{\%}$	S.D.		$\overline{\%}$	S.D.	
Field Trips	23.9	8.5		24.9	6.1	
Interracial Programs or Projects with Other Schools	14.1	5.6		13.7	2.6	
Cultural Enrichment Programs	15.1	8.9		13.3	5.2	
ESL or Bilingual Activities	6.7	2.3		7.9	3.2	
Group Counseling/Guidance	21.3	8.0		18.0	4.3	
Individual Counseling/Guidance	19.0	5.6		22.2*	4.5	

*Control group mean is significantly higher ($\alpha = .5$).

TABLE A-19. F-RATIOS FOR IMPACT ANALYSIS FOR ADJUSTED POSTTEST SCORES**

	Elementary								
Outcome	Pilot			Basic-Total			Basic-Minority		
	3	4	5	3	4	5	3	4	5
Reading Vocabulary	+0.50	-0.48	-0.91	+0.12	-1.31	-0.85	-0.05	-0.83	-0.09
Reading Comprehension	+1.71	-0.45	+1.05	+1.25	-0.67	+1.22	+1.96	-0.44	+3.39
Math Concepts	+0.09	-0.13	-0.46	-0.05	-0.88	+0.11	-0.59	-2.30	+2.97
Math Computation	+1.53	-4.26	+0.31	+1.03	-0.38	+0.01	+0.46	-0.57	+3.10

	Secondary					
Outcome	Basic-Total			Basic-Minority		
	10	11	12	10	11	12
Reading Vocabulary	-6.80*	-5.51*	-0.59	-5.19*	-6.06*	-0.02
Reading Comprehension	+0.00	-3.59	+0.03	-0.27	+0.14	+3.88
Math Concepts	-0.05	+0.81	-0.68	-0.60	-0.02	-0.43
Math Computation	-0.23	-0.35	-0.02	+0.08	-1.72	+0.67
Math Problems	+1.74	+0.12	+0.20	+0.05	-4.64	+0.47

** Sign indicates direction of mean difference: + indicates T ><, - indicates C > T.

*p < .05

TABLE A-20. FUNDING-TREATMENT INTERACTION: LEVEL OF EACH FUNDING IN THE TREATMENT SCHOOL

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.27	0.07	1.04	1.48	--	0.90	0.82	0.29	0.53	--
4	0.13	0.54	0.42	0.18	--	0.39	0.07	0.10	0.62	--
5	1.26	0.14	1.34	0.22	--	0.91	0.27	0.12	0.32	--
Basic:										
3	0.46	0.89	0.82	1.15	--	0.35	0.65	0.26	0.65	--
4	0.57	0.58	0.74	0.51	--	1.11	0.45	0.61	0.67	--
5	1.10	0.51	0.94	0.63	--	0.79	0.44	1.69	0.53	--
10	0.16	0.35	0.18	1.74	4.07	1.41	0.12	0.19	1.10	3.12
11	0.21	0.15	0.58	0.15	1.96	0.03	0.51	0.35	0.03	1.87
12	0.09	3.22	0.01	2.48	2.04	0.03	2.05	3.55	1.17	4.78*

* $p < .05$

TABLE A-21. FUNDING-TREATMENT INTERACTION: TOTAL SUPPLEMENTAL FUNDING LEVEL IN TREATMENT SCHOOL

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.78	1.91	0.57	0.55	--	0.13	1.57	0.16	0.22	--
4	0.91	0.70	0.07	0.19	--	0.81	1.42	0.09	0.05	--
5	0.28	0.04	4.56*	0.95	--	0.11	0.16	0.69	0.79	--
Basic:										
3	0.54	0.05	4.68*	1.54	--	1.24	0.51	5.33*	1.81	--
4	0.81	0.57	0.59	0.17	--	0.34	0.80	0.48	0.25	--
5	2.46	0.77	1.44	1.30	--	0.97	0.97	1.99	1.12	--
10	2.92	0.33	0.14	0.54	1.18	2.93	0.05	0.26	0.62	2.75
11	0.01	0.51	1.34	5.05*	1.96	0.04	0.08	1.02	10.23*	2.42
12	0.47	1.98	0.55	0.14	0.37	0.42	1.53	0.34	5.96*	0.41

*p < .05

TABLE A-22. FUNDING-TREATMENT INTERACTION: DIFFERENCE BETWEEN TREATMENT-CONTROL TOTAL SUPPLEMENTAL FUNDING

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	2.08	2.86	0.76	0.12	--	0.77	2.13	0.44	0.28	--
4	2.87	1.58	0.90	0.12	--	3.75*	2.48	0.92	0.11	--
5	1.77	3.63	0.52	1.64	--	1.68	2.78	0.69	1.93	--
Basic:										
3	0.67	1.41	0.57	5.35*	--	0.67	1.46	0.24	4.04*	--
4	0.52	0.47	1.04	2.41	--	1.01	1.08	1.90	3.29*	--
5	1.09	0.15	0.19	1.35	--	1.98	0.37	0.84	2.12	--
10	0.05	0.33	0.02	1.60	2.75	0.73	0.10	0.05	0.87	1.58
11	0.44	0.00	0.77	0.47	1.45	0.22	0.62	0.18	1.10	0.72
12	0.02	1.74	0.37	0.37	2.03	0.17	2.70	0.20	9.68	0.19

*p < .05

TABLE A-23. FUNDING TREATMENT INTERACTION: DISTRICT REGULAR FUNDING

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.26	0.14	0.14	7.39*	--	0.01	0.24	0.59	7.06*	--
4	0.74	1.96	0.85	1.28	--	0.22	0.21	0.50	1.38	--
5	0.42	1.63	0.30	0.43	--	0.47	1.51	1.22	0.38	--
Basic:										
3	0.33	0.67	0.07	1.26	--	0.61	1.53	0.27	2.12	--
4	0.71	1.19	2.81*	0.54	--	0.95	1.33	2.30	0.34	--
5	1.18	1.20	0.64	0.70	00	1.44	0.44	0.73	0.47	--
10	0.49	0.16	1.84	0.68	0.01	3.46	0.16	2.11	0.73	0.04
11	0.56	0.08	0.19	0.24	0.14	0.36	0.15	0.01	0.29	0.23
12	1.23	3.09	1.85	5.03*	1.33	2.03	0.25	0.20	3.58	0.53

* $P < .05$

TABLE A-24. EXPOSURE-TREATMENT INTERACTION: T-C READING EXPOSURE DIFFERENCE

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.13	3.66	1.19	0.04	--	0.06	1.79	1.33	0.23	--
4	0.99	3.18	0.23	0.50	--	0.27	2.35	0.09	0.95	--
5	0.13	0.82	1.82	1.69	--	0.32	0.44	1.43	1.38	--
Basic:										
3	1.39	1.40	0.82	0.75	--	0.39	3.51*	0.84	1.53	--
4	0.11	0.67	1.37	0.41	--	0.46	0.93	0.64	0.62	--
5	1.58	2.02	0.66	0.79	--	2.40	2.51	1.31	1.45	--
10	0.40	0.04	12.95*	0.73	0.26	0.04	0.33	5.86*	0.71	0.09
11	8.11*	2.31	0.72	1.02	0.37	10.18*	7.34*	0.83	0.76	0.34
12	0.89	0.17	1.22	0.49	0.62	0.89	0.51	0.05	0.50	0.45

* $P < .05$

TABLE A-25. EXPOSURE-TREATMENT INTERACTION: T-C MATH EXPOSURE DIFFERENCE

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.29	1.67	0.76	0.12	--	0.19	0.23	0.28	0.24	--
4	0.71	1.03	0.13	0.42	--	0.29	1.03	0.31	0.56	--
5	0.13	0.82	1.82	1.69	--	0.32	0.44	1.43	1.38	--
Basic:										
3	0.61	0.93	1.15	0.30	--	0.82	0.41	0.76	0.51	--
4	0.38	0.17	0.36	0.91	--	0.61	0.51	0.21	1.08	--
5	1.82	1.24	0.19	0.41	--	1.75	1.56	0.48	0.57	--
10	2.74	0.05	3.59	0.26	0.35	1.23	0.38	2.16	0.37	0.12
11	0.56	0.29	0.60	0.08	2.30	0.22	0.24	1.76	0.18	2.10
12	0.05	0.06	0.15	0.02	0.59	0.03	0.22	0.66	3.78	0.10

TABLE A-26. PROGRAM FOCUS-TREATMENT INTERACTION: WORD TECHNIQUES (VOCABULARY)

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	1.30	2.13	0.19	0.00	--	0.25	2.10	0.08	0.14	--
4	0.27	0.35	2.23	2.41	--	1.28	1.34	2.68	4.94*	--
5	0.66	1.92	0.57	0.16	--	0.79	1.98	0.30	0.13	--
Basic:										
3	0.22	1.03	5.92*	1.26	--	0.31	0.66	6.39*	1.38	--
4	0.56	0.71	1.10	1.49	--	0.42	0.38	1.15	1.33	--
5	2.37	1.27	2.16	3.19*	--	2.27	3.04*	4.10*	3.60*	--
10	0.04	0.30	1.52	1.16	0.96	0.11	0.62	1.28	1.17	0.30
11	0.16	0.69	1.14	0.24	1.33	0.08	1.28	0.69	0.21	0.88
12	0.90	1.94	0.02	0.05	0.77	1.65	1.01	0.85	7.49*	0.02

* $P < .05$

TABLE A-27. PROGRAM FOCUS-TREATMENT INTERACTION: READING COMPREHENSION

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.04	0.03	0.03	0.07	--	0.00	0.11	0.03	0.00	--
4	0.65	1.46	0.63	0.49	--	1.29	2.70	0.56	1.06	--
5	1.11	0.53	3.46	0.77	--	1.56	0.02	1.38	0.73	--
Basic:										
3	0.60	0.25	0.33	0.83	--	0.58	0.25	0.90	0.69	--
4	0.12	0.64	0.83	0.41	--	0.35	0.05	0.43	0.68	--
5	1.16	1.40	0.48	0.64	--	1.36	1.17	0.66	0.63	--
10	0.76	0.01	1.69	0.03	1.37	0.00	0.75	1.76	0.08	1.69
11	0.29	0.99	1.70	0.37	0.73	0.08	0.33	0.61	1.00	1.17
12	3.30	1.15	0.18	0.01	1.84	2.03	1.15	1.73	1.29	4.45

TABLE A-28. PROGRAM FOCUS-TREATMENT INTERACTION: MATH CONCEPTS

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.05	0.49	0.01	0.45	--	0.01	1.12	0.02	1.04	--
4	0.00	0.01	0.05	0.05	--	0.59	0.47	0.01	0.52	--
5	2.64	1.14	0.21	0.15	--	7.40*	0.03	0.35	0.41	--
Basic:										
3	0.17	2.49	0.81	0.18	--	0.59	2.63	0.68	1.06	--
4	0.58	1.02	0.72	1.44	--	0.35	1.00	1.21	2.11	--
5	0.68	0.43	0.47	0.86	--	0.62	0.40	0.11	0.55	--
10	0.58	2.86	1.71	2.20	0.73	1.37	0.65	3.59	4.06	0.03
11	1.23	3.68	1.27	0.01	0.10	0.75	3.47	4.15	0.00	0.08
12	0.70	0.26	0.81	1.32	0.89	0.79	0.48	0.00	0.02	0.62

* $P < .05$

TABLE A-29. PROGRAM FOCUS-TREATMENT INTERACTION: MATH OPERATIONS

Program & Grade	Raw Gain					Adjusted Score				
	Voc	Comp	M Conc	M Comp	M Prob	Voc	Comp	M Conc	M Comp	M Prob
Pilot:										
3	0.43	2.83	1.33	1.05	--	0.15	0.05	2.77	2.62	--
4	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--
Basic:										
3	2.32	1.34	2.37	2.01	--	1.62	0.97	3.86*	1.20	--
4	2.01	0.79	0.06	2.57	--	4.16*	2.41	1.56	3.42*	--
5	0.43	0.04	0.54	0.31	--	0.71	0.31	0.06	0.20	--
10	0.02	0.03	4.85	8.28*	0.38	0.07	0.41	4.10	10.54*	0.02
11	0.79	5.67*	2.09	0.01	0.14	1.26	5.68*	3.12	0.00	0.12
12	0.46	0.37	0.10	4.85	1.20	1.46	0.01	1.53	0.15	2.56

* $P < .05$

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
Elementary Student Characteristics			
ESTWT	Single-Item	Teacher report of student's ethnicity	Variable was dichotomized as white or non-white.
ESTXPCT	Single-Item	Teacher's educational expectations for students	
ESHRESR	Composite	Reading-related household resources	Composites indicated the number of reading-related or material goods/household resources present in the home.
ESHHRESM	Composite	Material goods/household resources (indirect measure of SES)	
ESIELOC	Composite	Internal-external locus-of-control	Composite indicated the extent of internal orientation toward traditional locus-of-control items.
ESBELNG	Single-Item	Student belonging in school	Variable was dichotomized as belonging or not belonging.
Secondary Student Characteristics			
SSWT	Single-Item	Student-reported ethnicity	Variable was dichotomized as white or non-white.
SSTXPCT	Single-Item	Teacher's educational expectations for students	
SSHHRESR	Composite	Reading-related household resources	Composites indicated the number of reading-related or material goods/household resources present in the home.
SSHHRESM	Composite	Material goods/household resources (indirect measure of SES)	
SSIELOC	Composite	Internal-external locus-of-control	Composite indicated the extent of internal orientation toward traditional locus-of-control items.

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES (SHEET 2)

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
SSBELONG	Single-Item	Student belonging in school	Variable was dichotomized as belonging or not belonging.
Teacher Characteristics			
TA006/TFAXPANY	Single-Item	Teaching experience in any school	
TA034/TFAWARM	Single-Item	Teaching style in motivating student	Categories were rank-ordered so that "high" reflected establishing a warm accepting climate for children, and "low" indicated rewarding specific academic/social behaviors.
TA035/TFAFLXBL	Single-Item	Teaching philosophy	Categories were rank ordered so that "high" reflected a flexible teaching approach, and "low" indicated a structured approach.
TA036/TFASPRD	Single-Item	Inservice training in reading	Variable was dichotomized as having received inservice training in reading versus no training.
TA041/TFAISRD	Single-Item	Recency of special training in reading	
Reading Program Characteristics			
TOTREAD	Composite	Total reading exposure	Composite indicated average total weekly reading exposure (hours).
SALPRO2 SALPRO6 SALPRO7	Composites	Exposure to activities of: tutoring by older person diagnostic test-taking independent seat exercise	Composites indicated the average weekly proportion of time spent in each activity relative to the total average weekly amount of time spent in reading.

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES (SHEET 3)

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
TCREG001/REGRWORD	Composite	Exposure to word attack skills activities	Word attack activities included matching letters or words, learning letter names, and developing whole word recognitions.
TCREG008/REGRCOMP	Composite	Emphasis on objectives related to comprehension skills	Comprehension skills objectives were related to the use of context clues, improving comprehension skills and improving comprehension rate.
TCREG010/REGRGLBL	Composite	Emphasis on objectives related to global skills	Global skills objectives included improving verbal communication, and developing study skills and library skills.
TCREG020/REGRMED	Composite	Frequency of occurrence of small/medium sized adult-student groups	Small groups comprised adult(s) and students in groups of between 2 and 10; medium groups comprised between 11 and 20.
TCREG024/REGRLING	Single-Item	Use of linguistic-phonetic teaching approach	Variable was dichotomized as using the linguistic-phonetic approach versus using other approaches.
TCREG028/REGRTEST	Single-Item	Frequency of diagnostic testing	
TCREG029/REGRDIAG	Single-Item	Extent to which diagnostic testing was used to guide instruction	
TCREG030/REGRSIZE	Single-Item	Reading class size	
TCREG033/REGRAIDS	Single-Item	Frequency of teacher use of para-professionals or teacher aides	

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES (SHEET 4)

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
TCREG034/REGRPROF	Composite	Frequency of teacher use of professional staff resources	Professional resources included remedial reading teacher, counselor or psychologist, media specialist, and resource teacher.
TCREG035/REGRNPRF	Composite	Frequency of teacher use of nonprofessional resources	Nonprofessional resources included teacher aide, parent or other volunteer, student teacher, and student in school.
TCREG036/REGRMAT	Single-Item	Degree of teacher influence in selecting instructional materials	
Math Program Characteristics			
TOTMATH	Composite	Total math exposure	Composite indicated average total weekly math exposure (hours).
SALPR13 SALPR16 SALPR17	Composites	Exposure to activities of: tutoring by older person games/contests diagnostic test-taking	Composites indicated the average weekly proportion of time spent in each activity relative to the total average weekly amount of time spent in math.
		Frequency of use of instructional resources:	
TDREG017/REGMBTXT	Single-Item	Basic texts	
TDREG018/REGMOTXT		Materials other than basic texts	
TDREG019/REGMDRLL		Drill and practice material	
TDREG020/REGMAVIS		Audio-visual material	
TDREG023/REGMBMCE	Composite	Exposure to basic math concepts	Math concepts included math vocabulary, number concepts, symbols and rules, equations and verbal problem-solving.

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES (SHEET 5)

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
TDREG024/REGMBSKE	Composite	Exposure to basic skills	Basic skills included fundamental operations and drill.
TDREG026/REGMATTN	Single-item	Emphasis on increasing attention span	
TDREG027/REGMTERM	Single-item	Emphasis on learning terminology	
TDREG030/REGMMAT	Composite	Teacher resourcefulness	Composite indicated the number of instructional materials generated by the teacher.
TDREG031/REGMTEST	Single-item	Frequency of diagnostic testing	
TDREG032/REGMADDI	Single-item	Extent to which diagnostic testing was used to guide instruction	
TDREG033/REGMSTD	Single-item	Math class size	
Contextual Characteristics (School/ District)			
$READ $MATH	Composite	Per-pupil expenditures in reading and in math (School)	Composite indicated total supplemental dollars-per-pupil spent in reading and in math in the school.
DISTREG	Composite	Per-pupil expenditures (District)	Composite indicated total regular dollars-per-pupil expenditures in the district.
ENROLL	Single-item	Total school enrollment	
PPCTITLI	Single-item	School SES Level	Variable indicated the percentage of students estimated by the principal to be economically disadvantaged (i.e., eligible for Title I funds).

TABLE A-30. IDENTIFICATION OF VARIABLES/MNEMONICS USED IN THE EXPLORATORY ANALYSES (SHEET 6)

Variable/Mnemonic	Indicator Type	Identification of Attribute/Dimension	Comments
SACTD	Composite	Extent of desegregation-complementary activities	Composite indicated frequency of district activities prior to and along with desegregation, such as media presentations, public meetings, contingency plans in case of interracial tension, and staff meetings.

TABLE A-31. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: READING ACHIEVEMENT*

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TCREG034 (PROF)											.081	
TCREG035 (NPRF)							-.145					-.114
TCREG024 (LING)				-.158			.076			-.144		
TCREG020 (MED)					-.071			-.192				.126
TCREG001 (WORD)						.186						.129
TCREG010 (GLBL)					.065							.142
TCREG008 (COMP)				.113								
TCREG023 (TEST)												
TCREG029 (DIAG)	-.056		-.139									
TCREG030 (SIZE)												.147
TCREG033 (AIDS)					-.062			-.109				
SALRP02 (TUTOR)							-.094					
SALPR06 (DIAG-T)			-.077		.086							
SALPR07 (INDSEAT)					.065							-.111
TOTREAD	.093											
TOTMATH	-.129		-.090						-.070	-.117		

*Blank entries indicate the beta coefficient was not significant.

TABLE A-31. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: READING ACHIEVEMENT* (SHEET 2)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
$READ	.119				.083		.127				-.218	
$MATH	-.110		-.085								.157	
DISTRICT	.057	.101	.087									
ENROLL	.105			.152								
PRCTITL1												
SACTD (ACT-DSEG)		.131						-.192	.061	.191		
P-RATIO			-.085							-.205		
TA006 (XPANY)	.076	.139	.153									
TA034 (WARM)												
TA035 (FLXBL)												
TA036 (SPT-MAT)					-.080	-.135						
TA041 (IS-RD)			.085					.167				
DIFFRM	-.068	-.149		.191				.146				
ESTXPCT (ESTXPECT)	.168	.180	.187		.232	.196	.262	.346	.205	.266	.259	.115
ESHHRESR	.050		.080		.059			.133				
ESHHRESM												

*Blank entries indicate the beta coefficient was not significant.

TABLE A-31. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: READING ACHIEVEMENT* (SHEET 3)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESBELNG	.062		.067									.115
ESTELOC									.115	.126	.099	.154
ESTBWT					.078		.087	.108	.131		.094	.217

* Blank entries indicate the beta coefficient was not significant.

TABLE A-32. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT*

Variable	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TDREG020 (AVIS)	.091		.108				-.103					
TDREG023 (BMCE)	-.075					.108						.163
TDREG026 (ATTN)												
TDREG027 (TERM)									-.104			-.128
TDREG030 (MAT)	-.216											
TDREG031 (TEST)									.063		.087	
TDREG033 (#STD)			-.073									
TDREG024 (BSKE)				.181								
TDREG032 (ADDI)					.083		.083					
TDREG017 (BTXT)			.083		.061		.096					
TDREG018 (OTXT)			.081			-.160		-.120	.064	.168		
TDREG019 (DRLL)												
SALPR13 (TUTOR)					-.061			-.120				
SALPR15 (GAMES)			.086									
SALPR17 (DIAG-TST)	.079		.097	.104						.152		
TOTREAD					.059			.185		.287		
TOTMATH			-.100	.160								

*Blank entries indicate the beta coefficient was not significant.

TABLE A-32. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 2)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
$READ		-.125			.095		.086	.272	.105		.090	
$MATH												
DBIREG$	-.069		-.082	-.130			-.086					-.137
ENROLL	.203		.201	.223				.195	.127		.169	
RPCTOL1	-.116		-.108	-.273					-.078			
SACTD (ACT-DSEG)				-.163					.085	.181		.132
PRATIO	-.065		-.079				-.090			-.141		
TA006 (XPANY)								.162				.128
TA034 (WARM)	-.066		-.070			.173			-.059			-.158
TA035 (FLXBL)		.138			.069	.153				-.140		
TA036 (SPT-MAT)					-.087		-.095					
TA041 (IS-RD)				.120								
DIFFRM		-.142						.134				.119
ESTXPCT	.108	.217	.129		.222	.153	.261	.273	.167	.212	.151	.146
ESHHRESR												

*Blank entries indicate the beta coefficient was not significant.

TABLE A-32. SIGNIFICANT BETA COEFFICIENT FOR PILOT ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 3)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESHHRESM												
ESBELNG	.074		.091		.061	.117	.076					
ESTELOC	.046			.091								.126
ESTBWT												

* Blank entries indicate the beta coefficient was not significant.

TABLE A-33. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: READING ACHIEVEMENT*

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TCREG034 (PROF)												
TCREG035 (NPRF)												
TCREG024 (LING)			.061								.052	
TCREG020 (MED)									-.048	-.095		
TCREG001 (WORD)	-.068	-.109			-.037		-.073		.045			.074
TCREG010 (GLBL)	.041											
TCREG008 (COMP)	-.048		-.085		-.047		-.054					
TCREG023 (TEST)											.053	
TCREG029 (DIAG)												
TCREG030 (SIZE)									-.050			-.110
TCREG033 (AIDS)												
SALPRO2 (TUTOR)									-.051	-.111		
SALPRO6 (DIAG-T)					.041							
SALPRO7 (INDSEAT)		.112			.055	.111	.085			-.089		
TOTREAD	.061		.057									
TOTMATH												

*Blank entries indicate the beta coefficient was not significant.

TABLE A-33. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: READING ACHIEVEMENT* (SHEET 2)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
$READ		.096										
$MATH			-.074			.085						
DISTRICT												.116
ENROLL		-.111						-.088				
PRCTITL1	-.082	-.117	-.064				-.061					
SACTD (ACT-DSEG)	.071	.101		.088	.100	.089	.116					
P-RATIO			-.091									
	0.066	.155	.074	.069	.092	.075	.136	.125	.047	.068	.089	.071
	3027	730	1509	784	2941	671	1499	771	2858	664	1440	754
					.141	.165	.192	.105				
TA006 (XPANY)					.039							
TA034 (WARM)												
TA035 (FLXBL)	-.045			-.123	.037							-.119
TA036 (SPT-MAT)												
TA041 (IS-RD)							-.059					
DIFFRM	-.080	-.183			-.048	-.094		.167				.116
ESTXPCT	.145	.136	.157	.103	.183	.167	.244	.174	.131	.189	.168	.084

*Blank entries indicate the beta coefficient was not significant.

TABLE A-33. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: READING ACHIEVEMENT* (SHEET 3)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESHHRESR					.075				.047		.104	
ESJJRESM					-.086							
ESBELNG											.061	
ESTELOC	.054			.122			.049					.084
ESTBWT			.099		.094		.118	.170	.083		.139	

*Blank entries indicate the beta coefficient was not significant.

TABLE A-34. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT*

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TDREG020 (AVIS)	-.061			-.133	-.081		-.079		.043			
TDREG023 (BMCE)	-.044								-.051			-.141
TDREG026 (ATTN)					.051		.063	.090	.056			-.079
TDREG027 (TERM)					-.057	-.076		-.123	.049			.095
TDREG030 (MAT)			-.057		.064	.098	.064					
TDREG031 (TEST)			.077		.053		.075			.084		
TDREG033 (#STD)					.052					.080		
TDREG024 (BSKE)							.091					
TDREG032 (ADDI)					.041			.099	-.044			
TDREG017 (BTXT)			-.017		.058		.098	.087		.080		
TDREG018 (OTXT)												
TDREG019 (DRLL)					.042							-.082
SALPR13 (TUTOR)					-.058		-.075					
SALPR15 (GAMES)	.037	.080						.080				
SALPR17 (DIAG-TST)												
TOTREAD		-.068		.102	-.780							

*Blank entries indicate the beta coefficient was not significant.

TABLE A-34. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 2)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TOTMATH												
$READ												.080
$MATH					.083	.158		.151	.064		.111	
DBIREG$			-.090	.151	-.090	-.103	-.090					
ENROLL	-.083	-.117	-.074						-.044			-.136
RPCTOL1	-.121	-.212	-.091		-.133	-.165	-.085	-.188	-.044		-.119	
SACTD (ACT-DSEG)	.079	.087	.121		.046		.109		-.043		-.060	
P-RATIO		.090	-.063		-.072		-.124					
R^2	.050	.113	.061	.069	.094	.122	.120	.097	.046	.067	.060	.080
N	3023	705	1554	764	2941	722	1438	781	2858	670	1449	739
TA006 (XPANY)									.051		.067	
TA034 (WARM)	.050		.083						.042		.091	
TA035 (FLXBL)												
TA036 (SPT-MAT)												
TA041 (IS-RD)									.044		.078	
DIFFRM	-.044	-.078		-.101		-.079						
ESTXPCT	.142	.221	.122	.102	.194	.258	.212	.141	.138	.207	.115	.151
ESHHRESR								.077				

*Blank entries indicate beta coefficient was not significant.

TABLE A-34. SIGNIFICANT BETA COEFFICIENT FOR BASIC ELEMENTARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 3)

Variables	GRADE 3				GRADE 4				GRADE 5			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESHHRESM							-.104			-.079		
ESBELNG	.040	.093	.050						.040			
ESTELOC											.055	
ESTBWT										.077		

* Blank entries indicate the beta coefficient was not significant.

TABLE A-35. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: READING ACHIEVEMENT*

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TCREG034 (PROF)												
TCREG035 (NPRF)												
TCREG024 (LING)												
TCREG020 (MED)										+.126		
TCREG001 (WORD)												
TCREG010 (GLBL)												
TCREG008 (COMP)												
TCREG023 (TEST)												
TCREG029 (DIAG)												
TCREG030 (SIZE)								+.138				
TCREG033 (AIDS)											+.115	
SALPR02 (TUTOR)												
SALPR06 (DIAG-T)												
SALPR07 (INDSEAT)											+.126	
TOTREAD	+.111	+.142	+.120		+.111	+.119		+.235	+.128	+.231		
TOTMATH								+.107	-.065			-.150

*Blank entries indicate the beta coefficient was not significant.

TABLE A-35. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: READING ACHIEVEMENT* (SHEET 2)

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
$READ												
$MATH	-.074		-.102			-.188						
DISTRICT				+.137		+.153					+.146	
ENROLL	+.063		+.082		+.095		+.118		+.509			+.115
PRCTITL1												
SACTD (ACT-DSEG)												
P-RATIO					-.060	-.148						
TA006 (XPANY)												
TA034 (WARM)				+.107								-.111
TA035 (FLXBL)												
TA036 (SPT-MAT)												
TA041 (IS-RD)												-.117
DIFFRM	+.078			+.131	+.062			+.115				
ESTXPCT	+.088		+.163		+.073		+.093	+.113				
ESHHRESR			+.197									
ESHHRESM			-.195						-.094	-.120		

*Blank entries indicate the beta coefficient was not significant.

TABLE A-35. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: READING ACHIEVEMENT* (SHEET 3)

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESBELNG												
ESTELOC	+.094	+.116					+.095		+.133	+.166		+.155
ESTBWT				+.106	+.082		+.077				+.096	
	1513	452	673	388	1447	354	724	369	1260	307	630	323

* Blank entries indicate the beta coefficient was not significant.

TABLE A-36. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: MATHEMATICS ACHIEVEMENT*

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
TDREG020 (AVIS)												
TDREG023 (BMCE)												
TDREG026 (ATTN)												
TDREG027 (TERM)												
TDREG030 (MAT)												
TDREG031 (TEST)								-.146				
TDREG033 (#STD)				-.110		-.092				-.116		
TDREG024 (BSKE)												
TRDEG032 (ADDI)												
TDREG017 (BTXT)												
TDREG018 (OTXT)	+.056	-.118	+.134							-.125		
TDREG019 (DRLL)												
SALPR13 (TUTOR)										+.175		
SALPR15 (GAMES)	-.079		-.084	-.124		-.093				-.152		
SALPR17 (DIAG-TST)	+.064		+.125									
TOTREAD								+.135				
TOTMATH					+.110	+.099	+.102		+.063			

*Blank entries indicate the beta coefficient was not significant.

TABLE A-36. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 2)

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
$READ												
$MATH	+.062	+.152								+.115		
DBIREG$	-.153	-.285		-.227	-.079				-.111	-.178	-.087	
ENROLL		+.116								+.143		
RPCTOL1	+.063		+.099							-.149		
SACTD (ACT-DSEG)	+.076		+.113		+.069	+.234			+.074			+.124
PRATIO			+.077									
TA006 (XPANY)									+.073		+.127	
TA034 (WARM)					-.084			-.127	-.073			-.117
TA035 (FLXBL)						+.101						
TA036 (SPT-MAT)												
TA041 (IS-RD)	-.053	-.134								-.111		
DIFFRM	+.068	+.186	-.156		+.101	+.257	-.117			+.163	-.192	
ESTXPCT	+.133	+.165	+.118	+.138	+.079	+.124						
ESHHRESR												

*Blank entries indicate the beta coefficient was not significant.

TABLE A-36. SIGNIFICANT BETA COEFFICIENT FOR BASIC SECONDARY SAMPLE: MATHEMATICS ACHIEVEMENT* (SHEET 3)

Variables	GRADE 10				GRADE 11				GRADE 12			
	Total	Low	Medium	High	Total	Low	Medium	High	Total	Low	Medium	High
ESHHRESM						+.150						
ESBELNG					+.112		+.119	+.138				
ESTELOC	+.085	+.108	+.098		+.091		+.115		+.059			
ESTBWT		+.189			+.123	+.187			+.097	+.183		
	1513	379	749	385	1447	357	722	368	1260	312	626	322

*Blank entries indicate the beta coefficient was not significant.

TABLE A-37. IDENTIFICATION OF ITEMS USED IN CANONICAL ANALYSES

VARIANCE/MNEMONIC	INDICATOR TYPE	VARIABLE DESCRIPTION	COMMENTS
Desegregation Related Actions (District Level)			
SACTD	Composite	District activities to facilitate the desegregation process	Composite of four items on district action to facilitate desegregation, e.g., public meetings
DMINTCH	Single Item	Percent of minority teachers in district	
Attitudes Toward Desegregation (School Administrators)			
SATTDES	Composite	Superintendent's attitude toward school desegregation	Composite of responses to three items about attitudes toward school desegregation, bussing and neighborhood schools
PATTDES	Composite	Principal's attitude toward school desegregation	Composite of responses to three items about attitudes toward school desegregation, bussing and neighborhood schools
Teacher Attitudes Toward Desegregation and Toward ESAA Related Programs			
TATCMPED	Single Item	Teacher's belief in the effectiveness of compensatory education programs	
TATCULT	Composite	Teacher's belief in the importance of cultural enrichment programs	Composite of five items on aspects of cultural enrichment programs that are of value
TATINTG	Composite	Teacher's attitude on integration/ desegregation	Composite of three Likert-type items on integrated housing, extent of prejudice and effectiveness of civil rights movement

TABLE A-37. IDENTIFICATION OF ITEMS USED IN CANONICAL ANALYSES (SHEET 2)

VARIABLE/MNEMONIC	INDICATOR TYPE	VARIABLE DESCRIPTION	COMMENTS
Measures of Degree of Integration Within School and Classroom			
ESTMIXR	Single Item	Extent to which students mix with students of other ethnic groups in recreational activities	Aggregation to school level of data obtained on the individual student
ESTMIXC	Single Item	Extent to which students mix with students of other ethnic groups in classroom activities	Aggregation to school level of data obtained on the individual student
MIXB-W	Single Item	Extent and quality of contacts between Black and White students in school	Aggregation to school level of data obtained from each teacher
Student's Attitude Toward School			
ESBELNG	Single Item	Student's feeling of belonging at school	Aggregation to school level of six-item composite computed for each student
ESLIKESC	Composite	Degree of student's liking of school	Aggregation to school level of six-item composite computed for each student
ESSXPECT	Composite	Student educational expectations (how far he will go in school)	Aggregation to school level of two-item composite computed for each student

APPENDIX B

ESAA NATIONAL EVALUATION ADVISORY PANEL'S

STATEMENT OF INVOLVEMENT

Since its inception in February, 1973, the ESAA evaluation has had the benefit of advice from a number of individuals in four fields, namely:

(1) Research Design:	Dr. William Coffman--University of Iowa Dr. Seymour Feshbach--University of California at Los Angeles Dr. Chester Harris--University of California at Santa Barbara Dr. Melvin Novick--University of Iowa Dr. David Wiley--University of Chicago
(2) Test Selection:	Dr. Nancy Cole--University of Pittsburgh Dr. Robert Hess--Stanford University Dr. Charles Thomas--Indiana University Dr. Ralph Tyler--Center for Advanced Study In Behavioral Sciences
(3) Equal Educational Opportunity:	Dr. Thomas Pettigrew--Harvard University Professor Meyer Weinberg--City College of Chicago
(4) Meta Evaluation:	Dr. Gene Glass--University of Colorado Dr. Michael Scriven--University of California at Berkeley Dr. Daniel Stufflebeam--Western Michigan University

During the first operating year (1973-74), criticism by organizations and individuals of the "Race Relations" questionnaire then in use resulted in withdrawal of the instrument. A "Blue Ribbon Panel" was then established to advise USOE and SDC on this aspect of the evaluation.

USOE asked several organizations to name panel representatives. The following were chosen by their respective organizations to be members of the panel:

Mr. Luis Alvarez
ASPIRA of America, Inc.

Dr. Boyd Bosma
National Education Association

Dr. Buell Gallagher
National Association for the Advancement of Colored People

Dr. Joseph Garcia and
Mr. Tony Vasquez
National Education Task Force de la Raza

Dr. Robert Hill
National Urban League

Dr. Thomas Hilliard
(replaced by Dr.George Jackson)
and Dr. Ruth King
National Association of Black Psychologists

Mr. Sam Husk
Council of Great City Schools

Mr. Lemuel Ignacio
Pacific Asian Coalition

Dr. John Stiglmeier
(replaced by Dr. Jess Elliott)
Chief School Officers
Committee on Evaluation and Information Systems

Dr. Charles Townsel
National Alliance of Black School Educators

In addition, the following individuals were chosen by USOE:

Dr. Edgar Epps
University of Chicago

Dr. Charles Glock
University of California at Berkeley

Dr. Patricia Gurin
University of Michigan

Dr. Ronald Milivasky
National Broadcasting Corporation

Mrs. Takako Okubo
Elementary Teacher

Mr. Paul Sheatsley
National Opinion Research Center

This second advisory group had four three-day meetings between March and August, 1974, and submitted critical comments and suggestions regarding various measures of intergroup relations. A new instrument on "School Climate" was constructed to replace the "Race Relations" questionnaire. The second year of the evaluation (1974-75) also reflects some adjustments in procedure, method, and purpose as a result of "Blue Ribbon Panel" participation.

At the November 1974 meeting of the evaluation advisors, the original panel members and the "Blue Ribbon Panel" (with a few changes in personnel) were brought together to form a single ESAA National Evaluation Advisory Panel, whose members continue to offer critical advice as the evaluation goes forward. This newly-constituted combined panel advises on all aspects of the evaluation project, including this and other reports.

The responsibility for this present report on the year 1973-74, as well as for the continuing evaluation process and its results, rests with the Office of Education and its contractor, System Development Corporation, not with the advisors. Nevertheless, after reviewing an early draft of this report, the panel as a whole has developed a statement which appears in Appendix C.

One advisor holds views about the evaluation project and this report which he believes to be of sufficient importance to warrant publication at this stage of the continuing evaluation. The views of Dr.George Jackson appear in Appendix D of this report.

APPENDIX C

STATEMENT OF ESAA NATIONAL EVALUATION ADVISORY PANEL*

In November 1974, the ESAA National Advisory Panel adopted the following statement:

It is the unanimous recommendation of the National Evaluation Advisory Panel that the first-year report by System Development Corporation of the ESAA Basic and ESAA Pilot evaluation focus on the descriptive aspects of the findings. Specifically, the report should describe characteristics of the programs that have been funded and implemented, characteristics of the student population that has participated in ESAA funded and matched control schools, and characteristics of the respective school staffs and administrators.

It is also the unanimous view of the National Evaluation Advisory Panel that an "impact" and "relational" analysis of the effects of the ESAA program on changes in reading achievement and mathematics achievement after less than six months of ESAA program implementation is premature. It is highly improbable that educational programs that have been in operation for so short a period of time could produce significant differential increments in academic skills.

The National Evaluation Advisory Panel is deeply concerned that the highly probable outcome of a first-year evaluation finding of "no significant differences" as a function of ESAA funding will be misinterpreted and misread as a commentary on the effectiveness of the ESAA program. The analyses of the first-year pretest and posttest achievement scores should be primarily addressed to the establishment of reliable base rates of performance.

Changes in academic achievement, in desegregation practices, in student and teacher attitudes, and in related outcome areas can be meaningfully evaluated only after a sufficient time has elapsed for ESAA funding to exert an impact. In this regard the analysis of educational changes after a two-year period of ESAA funding has scientific meaning and relevance. However, even more critical is the developmental analysis of educational changes that is planned for the third year of program evaluation.

The National Evaluation Advisory Panel wishes to underline the importance of a third year of funding in order to accomplish a meaningful evaluation of program impact and educational changes. The history of evaluation of federally-funded programs has too often been characterized by premature conclusions based upon the limited educational effects of programs that have been in operation for less than two years, or even as little as one year.

---

* It should be noted that this statement was drafted after review of an early draft of this report and has not been revised to reflect changes made since then.

ESAA programs were never viewed as magic elixirs that would produce dramatic transformations in achievement levels. To be fairly evaluated, the programs require a fair opportunity for implementation and for producing measurable educational consequences.

After reviewing a draft of the first-year report in June, 1975, the Advisory Panel expresses the following concerns:

1. Because of the relatively short period of time for ESAA program implementation within the first year, we reaffirm our earlier position that it is premature to expect significant gains in standardized test scores among the study sample due to ESAA funding.

2. Because of the relatively small differences in supplemental funds to ESAA-funded and comparison schools, it is also not reasonable to expect significant gains in standardized test scores as a result of ESAA funds.

3. Because of the emphasis in the first-year report on test scores as the primary criteria for program success and impact, we are disturbed that inadequate attention has been given to the importance of intervening or process variables, such as the attitudes and other characteristics of students and teachers, desegregation-related measures, other school climate measures, and length of exposure to different ESAA programs, as significant program correlates or measures of program success and impact.

Although we are aware that the lack of sufficient pre- and post-measures of program outcomes other than test scores is a serious constraint on satisfying these concerns, we still strongly urge that the highest priority be given to the incorporating of intervening process variables as significant dependent variables in this as well as in subsequent reports.

4. We are concerned that there has been insufficient in-depth analysis of program impact and correlates separately for students from different ethnic groups, specifically, Blacks, Spanish-speaking and Whites relating to measures other than test scores.

5. While we are aware that descriptive program information is being gathered at selected local sites, we feel that there is an urgent need to incorporate more of the descriptive local program data into the first-year report.

6. We think that special caution must be exercised with regard to the generalizability of particular findings in this preliminary first-year report because of severe constraints in the study design and methodology, specifically the reliance on standardized test scores and the use of national norms, even as baseline data, for students in the ESAA study sample.

CONCLUSIONS

The Panel wishes to acknowledge the assistance and cooperation of SDC in assisting the panel's efforts and in providing an opportunity for input from the panel. The recommendations and concerns expressed by that panel are primarily addressed to problems inherent in evaluations of this scope and magnitude rather than to the efforts of the research contractor.

APPENDIX D

POSITION STATEMENT ON YEAR ONE REPORT--ESAA EVALUATION PROJECT, PREPARED BY DR. GEORGE D. JACKSON, PH.D., CHAIRMAN, NATIONAL ASSOCIATION OF BLACK PSYCHOLOGISTS

June 19, 1975

While the Advisory Panel continues to be critical of the ESAA Evaluation Project, the National Association of Black Psychologists takes a stronger posture. The Association deems it essential to state for the record its unequivocal opposition to this project. It does not endorse the Year One Report.

Among the reasons for non-endorsement are the following:

1) The use of an experimental design drawn from the animal paradigm is immoral and inapplicable to the study of human achievement in the educational enterprise. Strong exception is taken to the use of money as an independent variable. The deliberate withholding of those which allegedly money could buy, apparently without consent of the affected persons, is inhumane and unconscionable. No justification, not even that of "limited funding" can alter the moral issue.

Recognition of the inapplicability, minimally at least at the pragmatic level, of this design is evidenced at the district level by the action of some superintendents who distributed money from other sources to the "control" schools. In this way they sought to provide equity for their students, but, in effect, "washed out" the design. The project reaction to this was to perform statistical manipulations aimed at determining the relationship between achievement and level of funding (if any). These manipulations, we contend, gave rise to spurious data.

2) We cannot endorse a study which employs as its dependent measure a standardized instrument which has been shown to be invalid for Blacks and other minorities. We also contend that restandardization assumes that the learning of pluralistic groups is referable to the normal curve. This assumption is of doubtful validity even when dealing with a homogeneous population. With a pluralistic society this assumption is untenable.

3) The lack of Latino and other non-Black minorities in this study makes it impossible to discuss minority isolation and other related issues in a social-scientifically valid manner. It suggests that an invidious form of racism pervades the ESAA Evaluation Project.

4) Data regarding activity of large cities is unavailable and, thus, this study has dubious merit in light of the weighty issues in contemporary urban education.

5) The assumptions revealed in the discussions on program suggest that the evaluators are not conversant with contemporary pedagogy. For example, the laboratory approach to mathematics is described as new; small groups are seemingly equated with individualization; categorization of remedial reading techniques contains inadequate differentiation.

6) The report contains a number of procedural statistical errors and questionable assumptions. In general it lacks the scholarship which we would expect to be present in a document which potends to have an effect on thousands of our young people.

For example, expected achievement for minorities is based on an anonymous memorandum and/or arbitrary readjustment of national norms. A more accurate picture could have been obtained by measuring students against their own baselines and along more than the two variable, reading and mathematics.

The ubiquitous use of percentiles and percents tends to obscure numbers and individuals. For example, if in a group of 100 people, 99 get a score of 90 or better and only one scores 89, the latter is classed in the 1st percentile. Also, contemporary remediation, which is a purported purpose of ESAA funding, tends to stress individualization and success of individuals. The prevalent use of percentages in this report tends to obscure this dimension.

Among other things, the small amount of funding received by some Basic/Pilot districts relative to the amount actually allocated to the area (e.g. New York) calls into question the generalizability of the results, even if they had been validly attained.

The Association of Black Psychologists recognizes that the above judgments were based on the first draft of the Year One Report. However, while changes may be made in the final draft, they will not alter the substantive objections which we have made above.

It is not our intention to impugn educational projects which may have been initiated with ESAA money. Moreover, it is recognized that some alterations in evaluative procedures may need to occur during the life of a project and should be made with scientific care. In this instance, however, the project design itself vitiates its stated purpose and, we contend, requires massive alteration.

At this point, our position must be made clear in the hope that this project and/or other attempts to evaluate educational activity with respect to minorities will avoid the many errors so vividly present here.